

May 2006

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**FINAL  
VIRGINIA KEY SECTION 1135  
ECOSYSTEM RESTORATION PROJECT**

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**Miami-Dade County, Florida**

**ECOSYSTEM RESTORATION REPORT  
WITH  
FINAL ENVIRONMENTAL ASSESSMENT**



**US Army Corps  
of Engineers®**

Jacksonville District  
South Atlantic Division

## MEMORANDUM FOR DISTRICT COMMANDER

SUBJECT: FINAL VIRGINIA KEY 1135 ECOSYSTEM RESTORATION REPORT  
CHECKLIST

1. PROBLEM. Use of northern Virginia Key as a spoil disposal site for nearby Federal navigation projects caused loss of aquatic and upland habitats valuable to protected and rare species. Restoration of these habitats along with creation of educational/recreational components on Virginia Key are recommended.

2. RECOMMENDATION. The proposed project would restore four native habitats impacted by disposal of dredged material (mangroves and freshwater wetland, coastal strand, and tropical hardwood hammock) and would include ancillary educational and recreational trails with interpretive signs. The restoration project would be consistent with public will and plans for Virginia Key Beach Park, a historically significant African-American beach.

APPROVED \_\_\_\_\_ SEE ME \_\_\_\_\_ OTHER \_\_\_\_\_

3. BACKGROUND AND DISCUSSION. See paragraph one.

4. IMPACTS. If transmittal of this final report forward is delayed the project will be postponed.

5. COORDINATION.

CESAJ-Ping Team Leader	<u>CONCUR</u> /NONCONCUR	<u>Mark Wolf</u>	DATE	<u>05 Apr 06</u>
CESAJ-Lead Proj Mgr	<u>CONCUR</u> /NONCONCUR	<u>[Signature]</u>	DATE	<u>10 Apr 06</u>
CESAJ-PD	<u>CONCUR</u> /NONCONCUR	<u>JH</u>	DATE	<u>6 Apr 06</u>
CESAJ-EN	<u>CONCUR</u> /NONCONCUR	<u>MHN</u>	DATE	<u>4/4/06</u>
CESAJ-RE	<u>CONCUR</u> /NONCONCUR	<u>[Signature]</u>	DATE	<u>4/24/06</u> AS Reviser
CESAJ-OP	<u>CONCUR</u> /NONCONCUR	<u>[Signature]</u>	DATE	<u>4/27/06</u>
CESAJ-OC	<u>CONCUR</u> /NONCONCUR	<u>[Signature]</u>	DATE	<u>3/22/2006</u>
CESAJ-DP	<u>CONCUR</u> /NONCONCUR	<u>[Signature]</u>	DATE	<u>5/22/06</u>
CESAJ-DE	<u>CONCUR</u> /NONCONCUR	<u>[Signature]</u> <u>ERIK L. STOR</u>	DATE	<u>23 MAR 06</u>

ERIK L. STOR  
MAJ, Corps of Engineers  
Deputy Commander

## Final Report Processing Checklist

### For the

Virginia Key Section 1135 ERR

CESAJ-ITR Team Leader Tom Smith

1. Has the ITR been completed on the final report document? NO ☐ YES ☒  
Has the ITR Team Leader certified the final report? NO ☐ YES ☒

CESAJ-PD \_\_\_\_\_

2. Are there any remaining unresolved technical issues? NO ☒ YES ☐

3. Have all items/questions in the Alternative Formulation Briefing (AFB) Planning Guidance Memorandum (PGM) been responded to in the subject report?  
NO ☐ YES ☐ N/A ☒

Have the proposed responses been at provided to MSC/HQ in advance as required?  
NO ☐ YES ☒

4. Have any new outstanding policy questions/issues, subsequent to the AFB, been identified? Have these been elevated to MSC/HQ for guidance/resolution?  
NO ☐ YES ☐ N/A ☒

*\* If not, why not?*

5. Do the MSC (DST& CoP Chiefs) and CECW (RIT&CoP) support the recommendation being made?  
NO ☐ YES ☒

*\*If not, why not and what steps are being taken to resolve the disagreement?*

6. Has the local sponsor provided a letter of intent in support of this phase of project development?  
NO ☐ YES ☒

7. Is the plan being recommended the NED/NER or locally preferred alternative?  
NO ☐ YES ☒

8. Have stakeholders been included in the study process? Have their concerns/support been considered in the decision process?  
NO ☐ YES ☒

9. Have federal, state and local resource agencies been consulted on this project?  
NO ☐ YES ☒

10. Has all environmental coordination for this phase of project development been completed?

NO \_\_\_\_ YES X

*\* If not what specifically remains to be done and when is completion expected?*

11. Has the executive summary been developed in accordance with HQ guidance (currently under development).

NO \_ YES \_ N/A X

12. Has the District Commanders project presentation been prepared in accordance with guidance issued by HQUSACE and SAD.

NO \_ YES \_ N/A X

13. The current feasibility report package includes the following in accordance with ER 1105-2-100, Appendix H:

- Feasibility Report with EIS or EA /FONSI
- Documentation and Certification of ITR
- Legal Review Certification
- Draft Report of the Chiefs of Engineers
- Draft Record of Decision
- AFB Project Guidance Compliance Memorandum
- Listing of Interested Congressional Delegation
- Report mailing List
- Draft Division Engineers Notice

NO \_ YES \_ N/A X

**CESAJ-Lead Project Manager Rene Perez**

14. Does the local sponsor understand cost sharing requirements to include LERRDs?

NO \_\_\_\_ YES X

15. Are cost sharing requirements consistent with current guidelines?

NO \_\_\_\_ YES X

16. Does the sponsor understand what they will be required to do under O&M obligations?

NO \_\_\_\_ YES X

17. Does the sponsor understand the review approval process, their role in responding to comments, and the historical timeframe such a review/approval may take?

NO \_\_\_\_ YES X



From: Austin, Denver R SAD  
Sent: Tuesday, March 14, 2006 9:24 AM  
To: Lucas, Susan S SAJ; Schwichtenberg, Bradd R SAJ; Wolff, Mark E SAJ  
Cc: Stratton, Terry D SAD; Sellers, Clyde H SAD  
Subject: Policy Review - Virginia Key, FL Section 1135 Final Report

MEMORANDUM FOR Jacksonville District, Attn: CESAJ-PD-PN

SUBJECT: Virginia Key, Dade County, Florida, Section 1135 Report  
(167408)

1. The subject report has been reviewed for policy compliance. Despite the major revisions that have improved the recommended plan, several issues remain on compliance and real estate. It is strongly recommended that these continuous real estate concerns be discussed with the Chief of Real Estate and quality control measures be employed to avoid non-compliance with policy comments in the future.

2. Key compliance concerns are:

a. The ITR in the Final report is dated 2003 and does not appear to cover the current report, as revised. An amended ITR covering the project in the Final Report should be accomplished and appropriate documentation with the report submission.

b. The 2005 Final Report shows sign offs for the DP and DE only. All others are dated 2003 and predate the major plan revisions contained in the final report. Due to the major revisions all functional chiefs should re-certify the technical accuracy of the report and independent technical reviews.

3. The issues and concerns previously identified in review comments dated 15 March 2003 for Real Estate "Appendix F" to the Draft Report dated February 2003 to do not appear to have been addressed in Real Estate "Appendix D" dated September 2005. While the formatting of the Appendix and acreages has changed, the substance remains the same. Comments on Appendix D are included as attachment 1. The 15 March 2003 comments on Appendix F are attached as attachment 2.

/s/

WILBERT PAYNES

Chief, Planning and Policy

Community of Practice

ATTACHMENT 1

1. Comments 1 thru 3 on attachment 2 remain applicable to Real Estate "Appendix D" and need to be addressed.

a. Paragraph 4 of Appendix D, Real Estate, states that all disposal material will be disposed of in an upland disposal site north of the project site and that this disposal site is available for project purposes via navigational servitude. There is no discussion to support the applicability of navigational servitude. Given the disposal site's characterization as an upland site, there needs to be some discussion as to how it came to be subject to servitude. Was the upland site created by disposal activity in an area previously considered to be navigable waters of the U.S.? Additionally there is no discussion as to what federal project/projects the disposal site is (or was) dedicated for use. Is the disposal site currently dedicated to a federal project and if so, who is the Non-Federal Sponsor (NFS) and who has O&M responsibility? Will the proposed 1135 project impact the disposal capacity of the disposal site for any current Federal navigation project? Who is the underlying fee owner of the disposal site? In addition as regards this Comment, paragraph 51 of the main report references an active disposal site. Is that the same site as proposed for this project? If so are any other federal projects impacted and what are the impacts?

b. Paragraph 8 of Appendix D, Real Estate, shows the proposed estate to be "fee" and Paragraph 9 says there are no non-standard estates. Paragraph 5 however states that the NFS owns the land in fee, with restrictions for public park use. There needs to a more complete discussion as to the estate owned by the NFS and its restricted uses. There is no discussion to support fee, albeit restricted, as the appropriate estate for the proposed 1135 project. If fee is the appropriate estate Paragraph 8 should show the required estate as fee with conditions, assuming we do not need to have any of the restrictions removed. The conditions need to be set forth. While not discussed in the report, it is my understanding that the NFS's ownership is subject to a reverter to the former fee owner upon certain conditions. This needs to be fully discussed and any risk of reversion analyzed. Paragraph 8 further states that the limited fee owned by the

NFS has a relatively low value, possibly zero. There is no analysis in Appendix D to support this conclusion. The language of the required estate should be set out in the appendix, not just referenced.

c. Paragraph 9 of Appendix D, Real Estate, states that servitude will be exercised over the upland disposal site and all lands located below the ordinary high water line. See comment 1 for the upland disposal site. There is no discussion setting forth the lands located below the ordinary high water line required for the 1135 project and the applicability of servitude to these lands for the proposed 1135 project.

2. Comment 4. on attachment 2. appears to be addressed in the main report. The corresponding discussion in the Real Estate Appendix should be modified accordingly.

3. Comment 5 on attachment 2. is now applicable to paragraph 124 of the main report.

4. Comment 6. on attachment 2. refers to a map in Real Estate "Appendix F" to the Draft Report dated February 2003. However while it is stated on page D-3 of Real Estate "Appendix D" dated September 2005 that "Project Maps are provided following this appendix" no maps are attached.

5. The project description in Real Estate "Appendix D" dated September 2005 calls for 3.2 acres of pond with wetland habitat. The SAJ response to the SAD Policy Review (comment 4) states that the pond was deleted. Which is correct and how is this feature treated in the project cost estimate?

## ATTACHMENT 2

1. Paragraph 4 of Appendix D, Real Estate, states that all disposal material will be disposed of in an upland disposal site north of the project site and that this disposal site is available for project purposes via navigational servitude. There is no discussion to support the applicability of navigational servitude. Given the disposal site's characterization as an upland site, there needs to be some discussion as to how it came to be subject to servitude. Was the upland site created by disposal activity in an area previously considered to be navigable waters of the U.S.? Additionally there is no discussion as to what federal project/projects the disposal site is (or was) dedicated for use. Is the disposal site currently dedicated to a federal project and if so, who is the Non-Federal Sponsor (NFS) and who has O&M responsibility? Will the proposed 1135 project impact the disposal capacity of the disposal site for any current Federal navigation project? Who is the underlying fee owner of the disposal site?

2. Paragraph 8 of Appendix D, Real Estate, shows the proposed estate to be "fee" and Paragraph 9 says there are no non-standard estates. Paragraph 5 however states that the NFS owns the land in fee, with restrictions for public park use. There needs to be a more complete discussion as to the estate owned by the NFS and its restricted uses. There is no discussion to support fee, albeit restricted, as the appropriate estate for the proposed 1135 project. If fee is the appropriate estate Paragraph 8 should show the required estate as fee with conditions, assuming we do not need to have any of the restrictions removed. The conditions need to be set forth. While not discussed in the report, it is my understanding that the NFS's ownership is subject to a reverter to the former fee owner upon certain conditions. This needs to be fully discussed and any risk of reversion analyzed. Paragraph 8 further states that the limited fee owned by the NFS has a relatively low value, possibly zero. There is no analysis in Appendix D to support this conclusion.

3. Paragraph 9 of Appendix D, Real Estate, states that servitude will be exercised over the upland disposal site and all lands located below the ordinary high water line. See comment 1 for the upland disposal site. There is no discussion setting forth the lands located below the ordinary high water line required for the 1135 project and the applicability of servitude to these lands for the proposed 1135 project.

4. Deleted.

5. Paragraph 119 of the main report is not entirely accurate as written. The real estate requirements/credit need to be more fully

explained. Appendix D may be referenced to avoid setting out a detailed analysis in both places.

6. Map does not appear to show the disposal area. It would also be helpful if the relevance of the "Areas" depicted on the Map in Appendix D was set forth in the Real Estate discussion. This should include appropriate estate for each.

7. The response to item 6 of the ITR Comments is not fully responsive. By the way who did the ITR and was it ever signed off on?

8. Deleted.

CESAD POLICY REVIEW  
VIRGINIA KEY SECTION 1135 ERR

1. Key compliance concerns are:

a. The ITR in the Final report is dated 2003 and does not appear to cover the current report, as revised. An amended ITR covering the project in the Final Report should be accomplished and appropriate documentation with the report submission.

**CESAJ-PD-PN (mw) - ITR was completed in 2003 as indicated. Subsequent report revisions involved the re-evaluation of the alternatives individually as well as in an additive fashion. No other substantial revisions to the project have occurred.**

b. The 2005 Final Report shows sign offs for the DP and DE only. All others are dated 2003 and predate the major plan revisions contained in the final report. Due to the major revisions all functional chiefs should re-certify the technical accuracy of the report and independent technical reviews.

**CESAJ-PD-PN (mw) – The revised Virginia Key ERR is currently being routed thru CESAJ for review/approval by all functional chiefs.**

3. The issues and concerns previously identified in review comments dated 15 March 2003 for Real Estate "Appendix F" to the Draft Report dated February 2003 to do not appear to have been addressed in Real Estate "Appendix D" dated September 2005. While the formatting of the Appendix and acreages has changed, the substance remains the same. Comments on Appendix D are included as attachment 1. The 15 March 2003 comments on Appendix F are attached as attachment 2.

**CESAJ-PD-PN (mw) - The issues and concerns dated 15 March 2003 had not been provided to this office prior to CESAD's 14 Mar 2006 email message. Required revisions and responses in reference to them follow:**

A. Paragraph 4 of Appendix D, Real Estate, states that all disposal material will be disposed of in an upland disposal site north of the project site and that this disposal site is available for project purposes via navigational servitude. There is no discussion to support the applicability of navigational servitude. Given the disposal site's characterization as an upland site, there needs to be some discussion as to how it came to be subject to servitude. Was the upland site created by disposal activity in an area previously considered to be navigable waters of the U.S.?

**CESAJ-RE-A (lhz) – Yes, the Real Estate Appendix has been updated to include that this site was created by placing dredged material from the Miami Harbor Navigation channel on the Key by the Corps.**

Additionally there is no discussion as to what federal project/projects the disposal site is (or was) dedicated for use.

**CESAJ-RE-A (lhz) – Report has been updated to include the Miami Harbor Navigation Project Disposal Site.**

Is the disposal site currently dedicated to a federal project?

**CESAJ-RE-A (lhz) – The Corps created it; it has been used for various projects, mostly Miami Harbor Navigation Project. This project will not interfere with that use; debris from the restoration effort will be placed there.**

and if so, who is the Non-Federal Sponsor (NFS) and who has O&M responsibility?

**CESAJ-RE-A (lhz) – Miami-Dade County is the NFS and the Federal Government has O&M responsibility.**

Will the proposed 1135 project impact the disposal capacity of the disposal site for any current Federal navigation project?

**CESAJ-RE-A (lhz) - NO**

Who is the underlying fee owner of the disposal site?

**CESAJ-RE-A (lhz) – State of Florida owns all submerged lands.**

B. Paragraph 8 of Appendix D, Real Estate, shows the proposed estate to be “fee” and Paragraph 9 says there are no non-standard estates. Paragraph 5 however states that the NFS owns the land in fee, with restrictions for public park use. There needs to a more complete discussion as to the estate owned by the NFS and its restricted uses. There is no discussion to support fee, albeit restricted, as the appropriate estate for the proposed 1135 project. If fee is the appropriate estate Paragraph 8 should show the required estate as fee with conditions, assuming we do not need to have any of the restrictions removed. The conditions need to be set forth. While not discussed in the report, it is my understanding that the NFS’s ownership is subject to a reverter to the former fee owner upon certain conditions. This needs to be fully discussed and any risk of reversion analyzed.

**CESAJ-RE-A (lhz) – There is a very low risk of impacts to this project even if reverted to former owner. The deed restricts any uses besides general public use. In addition, this island contains historical value to south Florida.**

**Additional Info: Miami-Dade County conveyed this 85-acre site to the City of Miami as part of the Lummus Island Land Exchange. On March 16, 1982 the Board of County Commissioners approved Resolution No. R-360-82, authorizing the conveyance of the parcel to the City and approving the City’s master plan for the park. The deed required that the property be used for public park purposes and kept open to the public, and that the City provide maintenance and service equal to that previously provided by the County. Additionally, any changes to the master plan would have to**

**be approved by the County. In the event the restrictions are violated, title could revert to the County.**

Paragraph 8 further states that the limited fee owned by the NFS has a relatively low value, possibly zero. There is no analysis in Appendix D to support this conclusion.

**CESAJ-RE-A (lhz) – Report has been updated to state that public lands have minimal value.**

C. Paragraph 9 of Appendix D, Real Estate, states that servitude will be exercised over the upland disposal site and all lands located below the ordinary high water line. See comment 1 for the upland disposal site. There is no discussion setting forth the lands located below the ordinary high water line required for the 1135 project and the applicability of servitude to these lands for the proposed 1135 project. **(SEE ABOVE)**

D. Paragraph 2 of Appendix D, Real Estate, states that Section 1135 authorizes the Corps to modify structures and/or operations of constructed Federal Water Resource projects for the purpose of improving the environment. It is unclear as to how the proposed site fits that requirement.

**CESAJ-PD-PN (mw) – Your attention is directed to;**

**1) the Syllabus (page i) “Project Purpose: Use of northern Virginia Key as a spoil disposal site for nearby Federal navigation projects contributed to the degradation of 185 acres of valuable habitat.”**

**2) Paragraph 3 (page 1) “...Dredged fill generated by the construction of Miami Harbor Federal Navigation Project (MHFNP) has resulted in the degradation of the quality of the environment associated with the MHFNP disposal area located on the north end of Virginia Key....”**

**3) Paragraph 51 (page 17) “Federal Project Connection to Virginia Key Restoration Figure A.1 (page 8.a) is a 1958 aerial photograph of the northeastern section of Virginia Key where the disposal area is located today. Habitat, estimated to be tropical hardwood hammock, mangrove and freshwater wetlands, dune/coastal strand, dry beach and shallow water can be seen extending northward from the sewage treatment plant located at the bottom-left of the picture. Figure A.2 (page 8.a) is a 1965 aerial of northern Virginia Key and shows a large amount of fill placed within the bounds of a spoil area designated in the 1965, U.S. Army Corps of Engineers “as-built” plan (page 8.b) for Miami Harbor 20-ft Project. The sewage treatment plant, located at the bottom of the photos and as-built, provides a reference point. The placed spoil covers a variety of habitats outlined (with estimated acreages) in Figure A.1. The loss of these critical habitats continues to affect ecosystem function and health within Virginia Key...”**



E. Paragraph 119 of the main report is not entirely accurate as written. The real estate requirements/credit need to be more fully explained. Appendix D may be referenced to avoid setting out a detailed analysis in both places.

**CESAJ-RE-A (lhz) – Will remove from main report and Reference Appendix D.**

F. Map does not appear to show the disposal area. It would also be helpful if the relevance of the “Areas” depicted on the Map in Appendix D was set forth in the Real Estate discussion. This should include appropriate estate for each.

**CESAJ-RE-A (lhz) – Report has been updated to reference maps in main report.**

G. The project description in Real Estate “Appendix D” dated September 2005 calls for 3.2 acres of pond with wetland habitat. The SAJ response to the SAD Policy Review (comment 4) states that the pond was deleted. Which is correct and how is this feature treated in the project cost estimate?

**CESAJ-PD-PN (mw) - The proposed construction of an additional freshwater pond/wetland complex as a component of Alternative 2A (see description in report page 23, paragraph 76 and Figure 8) were evaluated but not selected as a component of the NER plan. The description of the recommended and NER plan in Appendix D as well as in the main report (see page 42 paragraph 104) are consistent and accurate**

H. The response to item 6 of the ITR Comments is not fully responsive. By the way who did the ITR and was it ever signed off on?

**CESAJ-PD-PN (mw) - This project is a single-purpose ecosystem restoration project. As such, it was formulated and evaluated in terms of its net contributions to National Ecosystem Restoration (NER) outputs, expressed in non-monetary units, not NED or RED impacts (ER 1105-2-100, pp. 2-1 and 2-2.). NER impacts, EQ impacts and OSE impacts are all evaluated the Table 1. In addition, the four evaluation criteria specified in the P&G (acceptability, completeness, effectiveness and efficiency) are included in the table. See Page 34 - 38, Table 1. ITR was conducted in CESAJ by Mr. Tom Smith / PD-PN and completed in early Feb 2003.**

-----Original Message-----

**From:** Austin, Denver R SAD  
**Sent:** Friday, May 30, 2003 2:28 PM  
**To:** Duck, James C SAJ  
**Cc:** Strain, George M SAJ; Copeland, Ernest O SAJ; Rote, Russ L SAJ  
**Subject:** Policy Review - Virginia Key, FL Section 1135 Environmental Restoration Report (ERR)

CESAD-CM-P  
30 May 2003

MEMORANDUM FOR Jacksonville District, Attn: CESAJ-PD-P

SUBJECT: Policy Review - Virginia Key, FL Section 1135  
Environmental Restoration Report (ERR)

1. Policy review of the subject report raised three major issues.  
They are:

a. The report does not make a compelling case that this is an appropriate modification to a constructed civil works project.

b. The nature/scope of the "restoration" project is not consistent with existing USACE guidance.

c. The analysis of alternatives is deficient.

2. A time should be set when our staff can discuss these issues and work towards their resolution.

/s/

WILBERT PAYNES  
Chief, Planning and

Policy Division

Directorate of Civil

Works and

Management

SAD POLICY REVIEW  
VIRGINIA KEY, FL SECTION 1135  
ENVIRONMENTAL RESTORATION REPORT (ERR)

Critical Issues

1. **The report does not make a compelling case that this is an appropriate modification to a constructed civil works project.** The 1135 project is predicated on modifying the authorized Miami Harbor project to address habitat losses that resulted from construction and operation of an active dredged material disposal site (about 50 to 66 acres) on the north end of Virginia Key. While the report contains a significant amount of information about historic and present habitat types on Virginia Key, it does not characterize the habitats that once existed at the disposal site and provide the basis for formulation of the restoration project. The best

descriptions of former habitats at the disposal site is found in paragraphs 32 and 41. If an off-site area that is not directly a part of the Federal project is to be used as a restoration site to address impacts caused by a Federal project, there must be a compelling nexus between the completed project's habitat impacts (that they were unique and/or significant) and the proposed 1135 project's outputs. The case here is weak at best. Additionally, the report must demonstrate that the proposed project site is the most appropriate location to accomplish the modifications. This proposed project (as described in this report) is driven more by a desire to restore the park than to make project modifications that address impacts caused by past and present dredged material disposal activity.

Section 1135 is not a "mitigation" authority. If the rationale for the 1135 project as outlined above is not clear and compelling, we risk setting precedents (and an expectations) that we can and should perform restoration projects to address unmitigated impacts to habitats under every active dredged material disposal site.

**SAJ Response:** Based on new information provided by historical photos (Figure A, page 8.a) and a COE as-built drawing (Figure B, page 8.b), more accurate approximations of habitat type and acreage impacted by the active dredged material disposal site have been made. Approximately 185 acres of habitat on the northern end of the island were impacted by construction of a spoil disposal site from the 1965 Miami Harbor project.

Figure A.1 is a 1958 aerial of the northern tip of Virginia Key. Various habitats, outlined in the photograph, can be seen to the north of the wastewater treatment plant. The 1965 aerial in Figure A.2 depicts a large amount of fill placed over the same habitat. An Army Corps of Engineers as-built drawing from 1965 (Figure B) outlines a spoil area covering the same space as the fill in Figure A.2, confirming that the outlined habitats were impacted by fill placed from the 1965 Miami Harbor project.

The estimate of impacted tropical hardwood hammock and mangroves is in excess of 80 acres. Based on field inspections of the island an area of this size would most likely contain pond/freshwater wetlands however the acreage is impossible to estimate. Impacted dune/coastal strand is estimated to be in excess of 60 acres. Approximately 15 acres of dry beach and 30 acres of shallow water were also impacted. These estimates involve a certain degree of uncertainty and may range +/- 25%. The impacted area contains a higher percentage of upland than previously estimated, bolstering the necessity to restore critically endangered tropical hardwood hammock and dune/coastal strand habitats.

Due to its active status, restoration cannot take place at the disposal site, and a temporal loss of beneficial environmental output will result if restoration of these critical habitats is delayed until the site is deactivated. Therefore restoration of these habitats is proposed at nearby sites on Virginia Key. This allows for the proposed project's outputs to help restore ecosystem function to the environment impacted by the disposal site. This information is contained in paragraph 32, page 9 and paragraph 51, page 17 of the main report.

2. **The nature/scope of the "restoration" project is not consistent with existing USACE guidance.** With the exception of the small 2-acre pond proposed as part of this project, the proposed 1135 project consists of cutting and chipping exotic vegetation, planting native vegetation, and implementing an exotics control program to prevent re-infestation. The pond is a very minor project feature, which represents less than 10% of the project cost and does not appear to specifically re-create habitat destroyed by the creation of the disposal site. This project scope is completely inconsistent with the USACE role in ecosystem restoration as defined in current policy guidance (e.g., ER 1165-2-501). Current guidance clearly defines the USACE role in ecosystem restoration to be associated with activities that modify hydrologic conditions to achieve restoration outputs. Clearly, hydrologic modification involves altering terrain and/or changing the quantity, quality, timing, and/or distribution of water to produce environmental outputs. Activities such as exotics control may occur incidental to features which are consistent with USACE ecosystem restoration policy, but not as the primary activity. Some 1135 projects have been conducted that revolve primarily around revegetation and subsequent management for fish and wildlife. However, those cases have involved USACE project lands. Until the District submitted this report to SAD for approval, it was not apparent that this proposed "restoration" project consisted almost exclusively of exotics eradication and native species planting.

**SAD Response:** The revised project focuses on re-creating habitat in order to restore ecosystem function degraded or lost by creation of the spoil disposal site. While it is true that the proposed restoration includes a high ratio of upland to aquatic habitat, it is important to note that tropical hardwood hammock and dune/coastal strand are endangered native Florida habitats and de-grading them to create aquatic habitat would negatively impact the island's diverse ecological function. See paragraph 46, page 13 (main report); paragraph 129, page 49 (main report); Appendix 4, page 43-44; paragraph 3.3.1, page 10 (EA); and paragraph 3.3.2, page 11 (EA) for more information on these habitats.

ER 1165-2-501, paragraph 6, states, "The purpose of Civil Works ecosystem restoration activities is to restore significant ecosystem function, structure, and dynamic processes that have been degraded... Corps ecosystem restoration projects should utilize engineering and other technical solutions to water and related land resources problems, with emphasis on improving degraded ecosystem function and structure." The habitats proposed for restoration include both water and land resources with interrelated functions impacting the island's ecosystem and Biscayne Bay.

3. **The analysis of alternatives is deficient.** The Cost Effectiveness and Incremental Cost Analysis is summarized on pages 33-35 of the main report and in Appendix B (Environmental Studies) and Appendix C (Economics). Table 3 (page 34) in the report does not appear to adequately and accurately depict an appropriate analysis. Additionally, Table 3 in the main report and information in Appendices B and C (including Table C-4) present different and inconsistent results for the same alternatives. Our assessment is

that both Table 3 and C-4 incorrectly present the incremental analysis. When Alt 2 is incrementally compared to Alt 1, the costs associated with **additional** Alt 2 features should be divided by the HU increases from Alt 2 over Alt 1. This would provide an incremental cost/HU for Alt 2 features. Because of the manner in which the average costs per HU are presented, the more acres you restore, the less the average cost per HU. That is not a true incremental analysis. Also, we have some strong concerns about the analysis in Appendix B. Conceptually, developing a relative HU value for different habitats in accordance with IWR plan is OK. However, the three biologists who conducted the analysis are not named, nor are their credentials identified. This would be valuable and important information to lend credibility to the analysis. Furthermore, the biologists had widely varying assessments of the values of certain resources, such that one significantly outlying number can skew the results of the whole analysis. This occurred several times in this analysis. As currently presented, the analysis is very weak and does not effectively support the recommended plan.

**SAJ Response:** Concur, the project alternatives have been revised in accordance with the guidance provided. See the revised report.

Other comments are as follows:

4. Based upon a review of the MCACES estimate, the total cost of construction for the 2-acre pond would exceed \$200K. It is not clear where the idea for the pond came from, or how the pond feature was sized. The pond is not identified as a habitat feature destroyed by creation of the Miami Harbor disposal site. Given the high cost and lack of justification for this feature, this is a highly questionable project component. Please provide additional information to support including this feature in the project.

**SAJ Response:** As per comment #3 above, the alternatives have been changed and the pond construction alternative was not selected as part of the recommended plan.

5. Why were the restoration alternatives limited to the park? Perhaps there were more cost-effective and justified measures on other highly impacted areas of the islands. Perhaps a more significant concern in regard to looking beyond the boundaries of the park relate to exotics control and the long-term viability of the project. Paragraph 41 makes the case that a major exotics eradication and control program is necessary to prevent the park area from losing all of its natural biological value. Paragraph 97 argues that the alternative that removes exotics throughout the park will result "in a much higher probability that removal will be permanent." However, the entire boundary around the park would continue to be infested with exotic vegetation, with a strong likelihood that these areas would continue to provide a problematic seed source for the restored areas. The report should address this issue in detail in the report.

**SAJ Response:** The 132 acre park area is owned by the local sponsor and the focus of their interest. Paragraph 40, page 12: "site" has been changed to "island" in the first sentence. The final sentences, "Exotic invasive species control would be limited to areas described in the recommended plan. Other agencies are beginning control programs to treat remaining parts of the island," has been added.

6. Page 34 - Paragraph 97 indicates that alternative 3 "would also provide better connectivity between habitats that alternatives 1 and 2." From the maps in the report, the added features of alternative 3 over alternative 2 (areas 7, 8, and 9) appear to be rather remote from most of the rest of the restoration project and located at the extreme north end of the project site. Explain the above conclusion in support of alternative 3 in greater detail.

**SAJ Response:** This comment now pertains to paragraph 100, page 40. The new recommended plan includes alternatives 2, 3, and 4 which provide greater, uninterrupted coverage of habitats than any individual alternative alone.

7. Page 5 of the EA - Paragraph 1.8 states that the District "has determined that a water quality certificate, pursuant to Section 404 of the Clean Water Act, would not be required." However, the report contains a Section 404(b)(1) evaluation, which would indicate that the project involves a discharge of dredged or fill material into waters of the U.S., and consequently require state certification. Explain this apparent discrepancy in the report.

**SAJ Response:** The 404(b)(1) was included as a precaution but is not necessary.

8. The report should address each of the recommendations in the USFWS Coordination Act Report. The report should indicate whether USFWS recommendations were accepted and, if not, why not.

**SAJ Response:** USFWS recommendations were incorporated into the report.

9. Page 10. These are great photos but the captions seem to be wrong.

**SAJ Response:** Previous Figure 4, page 10 has been removed due to ambiguity.

10. Page 21, Objectives. These objectives are not logical. As worded, objective 1 eliminates any reason to consider the first two alternatives since they could not be 95 percent effective. Maintaining removal for three years and having survival rate of three years of 90 percent are types of specifications for a contract but are not sound objectives. Also, objective 3 should not specify two acres.

**SAJ Response:** Objectives for the new recommended plan on page 21 reflect the above comments.

11. Page 21, paragraph 62. This process does not seem to describe the procedure discussed in Appendix B.

**SAJ Response:** Above mentioned "paragraph 62" (now paragraph 64 on page 21) gives a general description of the team's plan formulation process. Appendix B has been modified to describe vegetation recommendations for restoration and no longer contains the inconsistency noted above.

12. Page 24, Alternative 3. The cost estimate does not include any planting of native species in area 7.

**SAJ Response:** Recommended plan and cost estimate have been revised. New cost estimate reflects planting of native species in all areas designated by the recommended plan.

13. Page 24, Alternatives. The descriptions do not portray alternatives but incremental addition of park areas. The alternatives are to restore or create 1) Tropical hardwood Hammock, 2) Coastal strand, 3) Mangroves, and, 4) freshwater pond and wetland complex. This is shown to be the actual process of analysis is Appendix B.

**SAJ Response:** Alternatives have been revised. Alternatives include differing acreages of various habitats. Appendix B shows the value of these habitats and the environmental benefit generated by their restoration according to different alternatives.

14. Table 2. This table does little to describe impact assessment. It merely depicts the three alternatives as Low, Medium, and High, implying that more is better. It does not give a comparison of potential output for each area compared to some desired level of output.

**SAJ Response:** Habitat Units for each alternative have been added which demonstrate the potential environmental output.

15. Page 34, Table 3. Table B-4 shows there are currently 92.84 HU. Over what period will the 13 units be lost? The gains may be overstated.

**SAJ Response:** Alternatives and Habitat Unit calculations have been revised. The loss predicts the continued habitat degradation anticipated (over the project life) if no restoration effort is conducted.

16. Page 34, Table 3. It appears that an alternative consisting of the areas encompassed by alternative 1 and 3 should be analyzed.

**SAJ Response:** Alternatives have been revised.

17. Page 34, paragraph 97. Based on the reasons given for project selection, it is apparent that the process described in comment 5 above is more appropriate. Based on the cost per acre, the most cost effective area to restore is the mangroves, followed by hardwood hammock, coastal strand and the pond and wetland complex. The Analysis in Appendix B shows no difference between the value of HU for each resource type. Based on this type of analysis, it is doubtful the 2 acre pond and wetland area would be recommended. It would be more cost effective to keep this area in hardwood hammock. The statement on patch size leads one to question if including recreation trails would actually degrade the ecosystem.

**SAJ Response:** The new recommended plan replaces the pond with tropical hardwood hammock. The comparatively small area impacted by recreational trails is not expected to degrade the ecosystem. To the contrary, through public education and subsequent public support of natural spaces the trails should positively affect natural ecosystems at the site and surrounding areas.

18. Page 48, Cost Apportionment. The \$27,500 credit to sponsor for real estate cost is in error as \$15,000 of this was a Federal cost. Also, the MCACES cost estimate shows the recreation component is \$111,000 total that should be \$55,000 each. The total first cost of construction also does not match the MCACES data.

**SAJ Response:** This section has been revised. See page 57, paragraphs 154 and 155.

19. Page 52, paragraph 170. Should include a provision that the area will be open to the public.

**SAJ Response:** Paragraph 39 (page 12) states that, "The park is planned to reopen to the public in Spring 2006."

20. EA page 6, Alternative 2 table shows 5.4 acres of Mangroves. Should be 2.4.

**SAJ Response:** Alternatives have been revised.

21. Appendix B, Page 5, Table B-4. The data in this table should be presented for each alternative. The data should show which resource the 2 acre pond is taken from. Also, account for the habitat being lost by the creation of the recreation trails.



**SAJ Response:** Concur. Table C-4 and C-5 (pages C-6 and C-7) give information on Habitat Units (HU's) for each alternative and the best buy alternatives, respectively. The 2-acre pond is not taken from a resource. It is created from current ruderal habitat. However, the proposed area for the pond would be planted with tropical hardwood hammock vegetation in alternative 2. Recreation trails are mainly located in tropical hardwood hammock. In this habitat the tree canopy, not the understory, is the main environmental resource. The canopy is not affected by the trails.

22. Appendix B, page 6, last paragraph. It looks like an opportunity to improve habitat from the ruderal habitat is being lost.

**SAJ Response:** This paragraph has been removed from the current report. However, the conversion of ruderal habitat to any of the proposed habitats would improve habitat output.

23. Restorative Vegetation Recommendations. Describe the density of the plantings.

**SAJ Response:** Specific measurements for plant density are given in Appendix B.

24. Appendix E, page 2. Growth of 88,054 recreation days was assumed over the Project's 50-year life. The analysis actually assumes all the growth at the beginning of the project. Discount appropriately.

**SAJ Response:** Computations found in Chapter 2 of the Principles and Guidelines, Section VIII, Appendix 3 for Unit Day Values assumes all growth occurs at the beginning of the project. Growth has always been presented in this manner.

25. Appendix E, page 3, Table 1. Dollar values shown as being FY 00. They are actually FY 01 values. Question is why FY 02 values were not used? Also, for this table explain how the instantaneous capacity/unit values were determined. For example, a density of 40 bird watchers per acre seems awfully dense. I would think bird watching would require a more solitary setting. Thus it might also be impacted by users of the multi-use trail. Also, it would seem that no capacity would be related to interpretive features. These are the users taking part in the activities.

**SAJ Response:** The values in Table 1 were revised using FY05 figures. Instantaneous values were also revised using SCORP use guidelines for outdoor recreation activities. Bird watching density has been corrected. Some, but not all, of the interpretive features will not be located on the multi-use trail. Therefore, some visitors will view the signs without using the trail system.

26. Appendix E, Tables 3 and 4. The formula for computing annual user days is incorrect. Based on information provided the 0.6 and 0.5 values should be used as multipliers, not divisors. This changes the answer dramatically.

**SAJ Response:** Do not concur. The formula should not have used 104 as the figure for weekend days, but 35 instead. The peak recreation season is from mid-May to mid-September. Sixty percent of the visitation will occur on weekend days and holidays during this four-month period. Half of all visitation to the park will occur during this four-month period.

27. Appendix E. There should be a discussion of the recreation activities and facilities provided by the existing project. Discussion is also needed on need for additional facilities for the new features, such as trash receptacles, rest rooms, handicapped access, etc. These could be made part of the project and cost shared.

**SAJ Response:** Paragraph 39, page 11, states that there is currently little use of the park for recreational, educational or other leisure pursuits and that the COM closed the park, except for social events, in 1982.

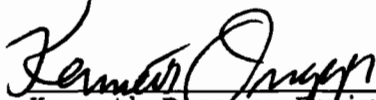
Currently, restrooms, parking and other amenities already exist in the project area. The City of Miami, the local sponsor, has funds to re-vitalize the restrooms without Corps participation. The City intends to begin work on this activity soon. The trail system, exotics removal and interpretive signage as proposed in the ERR are sufficient for their needs from a cost-sharing viewpoint. Verbiage will be added to the ERR to make this clearer.

28. Main Report, Figure 8. This figure is shown several times in the report. The Legend is confusing. The information shown under existing conditions is information shown in the report alternatives. The information under the proposed conditions seems to be a combination of existing conditions and proposed conditions. Revise to clarify.

**SAJ Response:** The figure referred to is now Figure 12, page 41. Figure has been revised according to new alternatives and recommended plan.

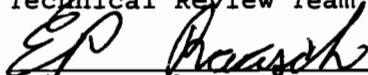
**STATEMENT OF TECHNICAL REVIEW  
COMPLETION OF INDEPENDENT TECHNICAL REVIEW**

The Jacksonville District has completed the Draft Virginia Key Section 1135 Ecosystem Restoration Report With Environmental Assessment. Notice is hereby given that an Independent Technical Review (ITR) has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the ITR, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy. The ITR was accomplished by an independent District team.



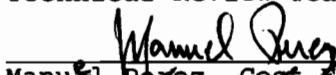
Kenneth Dugger, Environmental  
Technical Review Team Member

10 Feb 2003  
Date



Eric Raasch, Socio-Economics  
Technical Review Team Member

11 Feb 2003  
Date



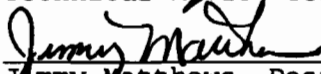
Manuel Perez, Cost Engineering  
Technical Review Team Member

2-04-03  
Date



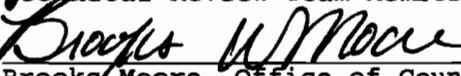
Joe Gurule/Ed Hodges, Coastal Engineering  
Technical Review Team Member

1/28/03  
Date



Jimmy Matthews, Design Engineering  
Technical Review Team Member

1-28-03  
Date



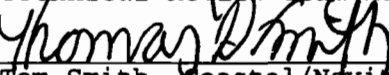
Brooks Moore, Office of Counsel  
Technical Review Team Member

1/29/03  
Date



Karl Nixon, Real Estate  
Technical Review Team Member

2/13/03  
Date

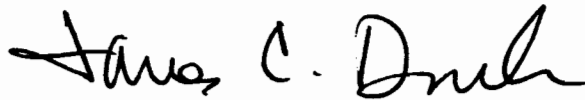


Tom Smith, Coastal/Navigation  
Technical Review Team Leader

1/28/03  
Date

# CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

All concerns resulting from Independent Technical Review of the Draft Virginia Key Section 1135 Ecosystem Restoration Report With Environmental Assessment have been mutually resolved and comments incorporated. The report and all associated documents required by the National Environmental Policy Act have been fully reviewed.



James C. Duck  
Chief, Planning Division

2-14-03

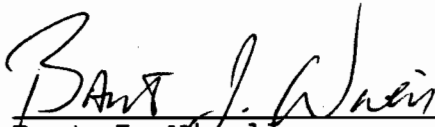
Date



Stephen C. Duba  
Chief, Engineering Division

2/14/03

Date



Bart J. Wivell  
Chief, Real Estate Division

2/19/03

Date

## Certification of Legal Review:

The report for Virginia Key Section 1135, including all associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, Jacksonville District and is approved as legally sufficient.



Lloyd D. Pike  
Chief, Office of Counsel

1/29/03

Date

**Quality Control Plan  
Virginia Key Section 1135  
Ecosystem Restoration Report with Draft Environmental Assessment**

**1. Purpose**

Quality control is the process employed to ensure the performance of a task meets the agreed-upon requirements of the customer and appropriate laws, policies and technical criteria, on schedule and within budget. Quality control for the Virginia Key Section 1135 Ecosystem Restoration Report (ERR) with draft Environmental Assessment will be accomplished through Independent Technical Review (ITR). Before a Corps report is approved it must undergo a technical and policy compliance review by higher authority. Technical review is conducted to ensure the proper selection and application of clearly established criteria, regulations, laws, codes, principles and professional procedures to ensure a quality product. Technical review also confirms the utilization of clearly justified and valid assumptions that are in accordance with policy.

**2. Study Authorization**

The authorization for this ERR is Section 1135 of the 1986 Water Resources Development Act (WRDA), as amended. Section 1135 authorizes the Corps to modify structures and/or operations of constructed Federal water resource projects for the purpose of improving the environment.

**3. Project Description and Location**

The proposed ecosystem restoration project includes restoration of native mangrove, coastal strand, and tropical hardwood hammock habitat, creation of a freshwater pond and wetland system, and constructing ancillary educational and recreational features to Virginia Key Beach Park, Dade County, Florida.

**4. Technical Review**

The Jacksonville District selected the in-house technical review alternative for the Virginia Key ERR because of the availability of knowledgeable, skilled, and experienced team members. The in-house technical review is expected to be advantageous with respect to time and money.

**5. Management Oversight**

Functional Division Chiefs are responsible for: (1) quality of work done by their personnel; (2) establishment of review team and team leader; and (3) resolution of conflicts between study team and review team.

**6. Study Management Oversight**

The project manager and planning technical leader are responsible for overall commitments and progress. The ITR team leader is responsible for coordinating and completing the ITR of the Virginia Key Section 1135 ERR. The project manager and planning technical leader coordinate study issues and guide the ERR process. The planning technical leader will coordinate review efforts with the ITR team leader. Specific duties of the project manager with respect to the review process include scheduling timely and sufficient periods for review of the Virginia Key Section 1135 ERR. Specific duties of the planning technical leader with respect to the review process include; (1) notifying the ITR team leader of review conferences; and (2) managing responses to review memorandums - includes consulting with South Atlantic Division on policy issues as necessary, and forwarding all unresolved technical issues to the appropriate functional chiefs for final determination.

## 7. Project Study Team

Technical team members are responsible for the technical analyses and appendices, and for development of the Virginia Key Section 1135 ERR and the accompanying NEPA documentation. The USACE and USFWS technical team members are provided below:

### USACE

Rene Perez	Project Management	USACE
Mark Wolff	Planning Technical Leader	USACE
Dan Abecassis	Plan Formulation Branch	USACE
Paul Stodola	Environmental Branch	USACE
Paul Stevenson	Environmental Branch	USACE
Peter Besrutschko	Environmental Branch	USACE
Tony Dipiero	Cost Estimating Branch	USACE
Doug Rosen	Geotechnical Branch	USACE
Tom Martin	Engineering Division	USACE
Dan Peck	Economics Branch	USACE
Joseph Anderson	Real Estate Division	USACE
Andrew Gude	Ecological Services	USFWS

## 8. Technical Review Oversight

The ITR team leader is responsible for coordinating all activities associated with the technical review. Duties will include the following: (1) determining the need for ITR team members' attendance at planning meetings and conferences, as well as ITR meetings; (2) compiling ITR comments and submitting them in writing to the planning technical leader and ITR team members; (3) maintaining a reading file for the use of the ITR team; (4) working with planning technical leader and ITR team members to facilitate resolution of technical issues, and documenting these issues and resolutions; and (5) coordinating the written

certification of the independent technical review by the ITR team members and appropriate functional chiefs.

Tom Smith

Plan Formulation Branch

USACE

#### 9. Technical Review Team

George Strain	Plan Formulation
Eric Raasch	Plan Formulation
Kenneth Dugger	Environmental
Joe Gurule	Coastal Engineering
Manuel Perez	Construction Cost Estimating
Jimmy Matthews	Engineering/Tech Services
Karl Nixon	Real Estate
Brooks Moore	Office of Counsel

The ITR team is responsible for performing independent technical review of the Virginia Key Section 1135 ERR, technical appendices, and NEPA documentation. The team will utilize ER 1110-1-12, "Quality Management," EC 1165-2-203, "Technical and Policy Review" and CESAD-ET "Technical Quality Guidelines" dated 13 March 1997 as guides to conducting the technical review. Duties of the team include the following: (1) reviewing report contents for compliance with established principles and procedures, using clearly justified and valid assumptions; (2) reviewing methods, procedures, and material used to determine appropriateness, correctness, and reasonableness of results; and (3) providing ITR team leader with documentation of comments, issues, and decisions arising out of the independent technical review.

Each member of the technical review team has extensive experience in his/her respective field while employed by the U.S. Army Corps of Engineers, and is highly qualified to review the report in accordance with the requirements and responsibilities discussed above.

#### 10. Independent Technical Review Checkpoints

Milestones for the conduct and ITR of the Virginia Key Section 1135 ERR are provided below:

Initiate ERR	May 2001
Initiate ITR	Apr 2002
Complete ITR of Draft ERR w/ Draft EA	Jan 2003
Complete Draft ERR w/ Draft EA	Feb 2003
Final ERR/NEPA	Jun 2003

# **MEMORANDUM For Record**

**DATE: 12 Feb 2003**

**SUBJECT: Virginia Key Section 1135 Ecosystem Restoration Report w/ Draft Environmental Assessment, Comments and Responses**

**1. The report is missing pages 17-24.**

**Response: Concur. Pages missing were included in original sent to printer but not printed. A review copy of the final report will be requested and checked for missing pages before all report copies are printed. See Pages 17-24.**

**2. Item 5. Page 3, Real Estate Appendix describes that temporary work area easements will be required to support the project. Item 12, The Real Estate Baseline Cost Estimate does not include any estimate for such easements. It further states that, "All project lands are publicly owned lands or are below the mean high water mark". This should be identified and quantified.**

**Response: Do not concur. Real Estate Cost Estimate included in appendix provides cost estimate for administrative costs to sponsor for certifying lands to us for project. Lands are identified on map and quantity of acres for each recommend restored area. See Appendix D, Real Estate, Page 8, map added.**

**3. Item 10, Page 4 – There is no referenced map following the Real Estate Appendix.**

**Response: Concur. Copy of project map that should have followed the Real Estate Appendix. See Appendix D, Real Estate, Page 8, map added.**

**4. Item 12. Page 4, Temporary Work Area Easement - the number 108.60 is not identified.**

**Response: Concur. The 108.60 has been corrected, total acreage required is 72.2 acres. See Real Estate Appendix Page 4, Item 5.**

**5. In general, the report is well written and presents a strong basis for the recommended restoration plan.**

**Response: Thank you! We have worked hard on it.**

**6. Main Report, Table 2, pg. 29 – This table should also include a display of expected NED (National Economic Development) and RED (Regional Economic Development) impacts for each alternative. NED impacts will include project costs and recreation benefits. RED impacts will include additional regional income and employment associated with project costs and recreation benefits, and secondary or multiplier effects on the regional economy. Although most of these impacts are expected to be minor, they should be displayed, as NED and RED accounts are required to be displayed, along with EQ and OSE accounts.**



**Response:** Concur, Table 2 has been revised to include NED benefits. See Page 29-32, Table 2.

**7. Main Report, Summary Of Plan Impacts, pg. 36 –** Similar to the comment above, NED and RED impacts should also be discussed in this section.

**Response:** Concur. NED/RED impact discussion added to report. See Page 39.

**8. Appendix C, Economic Studies, 5<sup>th</sup> page, second paragraph –** The reference to “six alternative restoration plans” should be changed to “four alternative restoration plans”.

**Response:** Concur. Report has been changed. See Appendix C, Page 5, Paragraph 2.

**9. Appendix E, Recreation Resources –** The sections on “Incremental Analysis” and “Recreation Alternative Evaluation Matrix” should be deleted. Because recreation is an NED project purpose, it should be evaluated using traditional benefit-cost analysis. Incremental evaluation of recreation alternatives should focus on incremental costs and benefits, and identify the level of recreation development that provides the greatest margin of benefits over costs (i.e. the NED maximizing plan for recreation development).

**Response:** Concur. NED benefits have been included in the Recreation Appendix. See Appendix E, Page 7, Paragraph 2.

**10. General Editorial Comment –** The pages of the appendices should be numbered.

**Response:** Concur. Report has been revised accordingly. See Appendices A through H.

**11. Consider using color photograph for figures 1, 3 & 4 in Engineering Appendix.**

**Response :** The copy of the Engineering Appendix provided to PD did contain color photographs for figures 1, 3, and 4. See Appendix A, Engineering, Pages 2, 5, and 7.

**12. North arrow and scale should be shown on figure 4.**

**Response :** North arrow and scale have been added to figure 4. See Appendix A, Engineering, Page 7.

**13. There appears to be no engineering basis for the size and shape of the freshwater pond.**

**Response :** Do not concur. The design of the freshwater pond is based on similar successful designs used at Cape Florida State Park, located on Key Biscayne, adjacent to Virginia Key. The pond size and location were also limited by the presence of nearby roads, culverts, power-lines, and parking areas. The freshwater pond was delineated after careful analysis of proposed project soil maps and vegetation aerials in conjunction with ground truthing to determine what extent or limits the pond should possess.

14. Total cost estimate and figure identification for constructing the freshwater pond should be shown on page 8.

Response : The cost estimate and figure number have been included on page 8 of Appendix A, Engineering, paragraph 2.

15. Clean Water Act Jurisdiction (environmental compliance issue): page EA-12, 3.3.3 Wet Areas; page EA-17, 4.3.1.3 Wet Sites; page EA-22, 4.21.5 Clean Water Act; and page EA-24, E.O. 11990 Protection of Wetlands: It is not entirely clear based on this text that there would be no impacts to jurisdictional wetlands or other areas subject to the Clean Water Act (section 401 Water Quality Certification or Section 404 on impacts to wetlands and other waters of the United States). On page EA-24, E.O. 11990 Protection of Wetlands, it is stated that exotic vegetation would be removed from existing wetlands. This implies an activity in wetlands subject to the Clean Water Act (unless these are not jurisdictional wetlands). If there is an activity subject to the Clean Water Act, a 404(b) evaluation would be needed. The state could exempt the activity from a Section 401 WQC or authorize it by General Permit but this does not necessarily remove the activity from Clean Water Act jurisdiction.

Response: Concur. The text has been rewritten to clearly show that the wetlands in question are believed to be isolated and, therefore, not jurisdictional. Based on this determination, a Section 404(b) evaluation is not required. See Draft Environmental Assessment, Page 13, 3.3.3; Page 19, 4.3.1.3; Page 23, 4.21.5; and Page 25, 4.21.21.

16. Syllabus: Not a mitigation project...

Response: Concur. Wording has been revised. See Syllabus Page i, Project Purpose.

17. Syllabus: There is a discrepancy in First Cost and total cost. Should be the same. Add LERRD and P&S to first cost.

Response: Concur. Report has been revised. See Syllabus page i, Costs.

18. General: No personal pronouns in Corps reports.

Response: Concur. Report has been revised accordingly. Throughout report.

19. Par. 89, p. 34. Need plate showing recommended plan clearly.

Response: Concur. Plate 8 shows recommended plan. It will be printed in color in final report to aid ease of interpretation. In addition, it has been renamed to improve clarity. See page 23.

20. Par. 91, p. 34. Need better rationale—most important page in report.

Response: Concur. Report has been revised accordingly. See Page 35, Paragraph 101.

21. Par. 109, p. 38. Land needs to be dedicated to project? Not dredged material area? Is this valid? No credit for lands? Does RE agree with this? \_\_\_\_\_ costs could maybe be given credit?

Response: Do not concur. Local sponsor owns lands park lands proposed for restoration and lands will remain a park. The only costs involved are administrative (as indicated on Page 39, paragraph 119) and their costs will be credited (also as indicated in paragraph 119). No changes required.

22. Tab. 3, p. 38. Add LERRD. Include real estate costs as a line item.

Response: Concur. Table has been changed as requested. See Page 40, Table 4.

23. P. 43: Trade-Off Analysis. Unusual write-up. Does not follow normal report process.

Response: Do not concur. Section was written according to feasibility report content outline in Appendix G and planning principles (Chapter 2) of the Planning Guidance Notebook (ER 1105-2-100). Write-up was also based on presentation and discussion of trade-off analysis for ecosystem restoration projects at HQ-sponsored training workshop January 2002. Report has been revised to improve clarity. See Page 44, Trade-Off Analysis.

24. Figure 8 does not clearly show the areas. A darker font and darker outline of areas would be helpful.

Response: Concur. Final draft and final report will both have figure reproduced in color. See Page 23.

25. There's very little information in the report on the impacts of the Corps projects on Virginia Key. There is a general statement that disposal of dredged material has impacted 50 to 100 acres at the north end of the key. What resources were impacted? Since environmental impacts are the basis for 1135 applicability, I think more detail on how Corps activities affected the area would be helpful.

Response: Concur. Information in the report is limited by lack of ecological information available on the area impacted by the original Corps project. The best team members could do is make educated professional judgments about resources likely to have been impacted based on those present in other areas of Virginia Key and on other Biscayne Bay islands. See Page 17, Paragraph 51.

26. Page 45, paragraph 131: I think a through c are intended to be items in a list, d and e should be separate paragraphs, and f through h are items under e. The sequential lettering does not make sense to me here.

Response: Concur. Report has been changed as suggested. See Page 46, Project Cooperation Agreement.

27. Page 46, paragraph 137: I do not understand the \$27,000 real estate credit. Please explain. And I don't understand how it is applied.

Response: The \$27,500 is sponsor's administrative costs to certify LERRD to us. See Page 39, Paragraph 119 and Page 48, Paragraph 148.

28. Page 47, paragraph 138: Costs for the recreational component are never explained. What would we get for \$91,600. Where is recreational part described?

Response: Do not concur. The recreational component is included in Figure 8, page 23, described in par. 75, page 25 and in par. 116-117, pages 40-41. In addition, a detailed recreation benefit analysis is contained in Appendix E. However, the Recommended Plan section of the main report and the Recreation Resources Appendix have been revised to provide a concise summary of recreation features proposed under the recommended plan. Hopefully, this will minimize confusion for the reader and alleviate the need to flip from section to section to find pertinent information. See page 23, page 25; paragraph 79, Page 35; paragraph 101, and Appendix E, Recreation Resources.

29. Paragraph 91 states that by group consensus alternative three was selected. This raises a Federal Advisory Compliance Act issue. Who was on this group that made this decision. Can we delegate our decision of a recommended plan to others? This is not to suggest we could build a project without our Non-Federal Sponsor agreeing.

Response: Concur. Report was unclear and has been revised. See Page 35 Paragraph 101.

30. Paragraph 109 states that no acquisition costs are necessary since the City owns the property. I thought the Non-Federal Sponsor is to receive credit for the value of lands they provide to the project and it was not important if the Non-Federal Sponsor had to purchaser acquire the lands. Please help me understand this. (Also see paragraph 143.)

Please see response: to #'s 21 & 27 above.

31. Paragraph 134 indicates that this project is to be budgeted. Is this correct for a continuing authority project?

Response: Concur, paragraph as been revised accordingly. See Page 47 Paragraph 145.

32. Paragraph 154 addresses our duty under the Coastal Zone Management Act. Please indicate that our project needs to be compatible "to the maximum extent practicable."

Response: Concur. Report has been changed as requested. See Page 51, Paragraph 165.

33. I assume from the report that the Non-Federal Sponsor will not be performing any in-kind work. Is this correct?

Response: Correct. The Non-Federal Sponsor will not be performing any work in-kind.

34. Draft EA 4.2 The endangered species coordination is not complete. Has it been completed?

Response: Coordination under Section 7 of the Endangered Species Act has now been completed. See EA Page 15, Paragraph 4.2.

35. EN-C- (MP)-1. MCACES, Alt.1, Title Page 2. Suggest indicating in the narrative the areas of work included for this alternative. Spell check: "exitics".

Response: Concur – will include areas in narrative and will correct typo. See Engineering Appendix, MCACES, Alt.1, Title Page 2.

36. EN-C- (MP)-2. MCACES, Alt.1, Title Page 2. Narrative indicates the recreation component includes 8 signs. Page 21 of report indicates 10 educational signs. Clarify discrepancy.

Response: Concur. Report has been changed to indicate 8 educational/recreational interpretive signs. Page 21, Paragraph 61.

37. EN-C- (MP)-3. MCACES, Alt.1, Title Page 2. Suggest adding a note in the narrative indicating major uncertainties or risk on this project that makes estimator use 50% for contingencies on all construction features.

Response: Concur. Revised MCACES in report revised. 50% contingency not included in this version. See Appendix A, Engineering.

38. EN-C- (MP)-4. MCACES, Alt.1, Contents Page 1. Suggest removing this page in its entirety.

Response: Do not concur. EI 01D0101 4.3 b indicates a table of contents should be included. See Engineering Appendix, MCACES, Alt.1, Contents Page 1.

39. EN-C- (MP)-5. MCACES, Alt.1, Summary Page 1. Chart of Accounts was not used.

Response: Do not concur. Chart of accounts was not used since this is an environmental restoration project, and the Civil Works WBS does not currently have an item for restoration projects. See Engineering Appendix, MCACES, Alt.1, Summary Page 1.

40. EN-C- (MP)-6. MCACES, Alt.1, Summary Page 1. Suggest changing the columns format as to show only 3 columns: construction cost, contingencies and total cost. The PE&D cost and the S&I cost should be shown as separate cost items, located below the construction cost with their respective chart of account (Codes 30 and 31).

Response: Do not concur. It is this estimator's prerogative to show these items as is since a detailed breakout for PE&D was not provided and a percentage was applied. See Engineering Appendix, MCACES, Alt.1, Summary Page 1.

41. EN-C- (MP)-7. MCACES, Alt.1, Summary Page 2. Page 22 of report describes Alternative #1 to clear exotics and replant coastal strand habitat on 3.08 Acres and likewise to clear exotics and replant tropical hardwood hammocks on 40.10 Acres. Cost estimate includes 1.75 Acres and 32.59 respectively. Clarify discrepancy in acreage.

Response: Concur; acreage figures for each habitat type proposed for restoration have been corrected throughout the report. See Syllabus, Page 24; Alternative one, Page 35; Paragraph 101, and Appendix A, Engineering, MCACES, Alt.1, Summary Page 2, and Appendix D, Real Estate; Page 4, Paragraphs 4 & 5.

42. EN-C- (MP)-8. MCACES, Alt.1, Summary Page 2. Cost estimate does not include cost for benches mentioned in narrative. Also cost estimate includes only 8 signs and Page 21 of report indicates recreation component to include 10 educational signs. Clarify omission and discrepancy.

Response: Concur. Revised MCAECES estimate included 8 signs and 15 benches as per report narrative. See Appendix A, Engineering, MCACES, Alt.1, Summary Page 2.

43. EN-C- (MP)-9. MCACES, Alt.2, General. Apply comments No. 1 through 8 to Alternative #2.

Response: See above. See Appendix A, Engineering, Alt.2.

44. EN-C- (MP)-10. MCACES, Alt.2, Summary Page 3. Page 24 of report describes Alternative #2 to clear exotics and replant tropical hardwood hammocks on 28.94 Acres in areas 3 through 6. Cost estimate includes only 7.13 Acres in Area 3 and 12.26 in Area 6 for a total of 19.39 Acres. Clarify discrepancy in acreage.

Response: Concur, MCAECES estimate has been revised. See Page 24 alternative two and EN-C MCACES, Alt.2, Summary Page 2-3.

45. EN-C- (MP)-11. MCACES, Alt.2, Summary Page 3. Page 24 of report describes Alternative #2 to clear exotics and replant mangroves in 2.37 Acres of habitat in areas 3 through 6. Cost estimate includes 2.37 Acres of "Wetland Strand Plantings". Is this species considered a mangrove? (Sorry, I'm not a biologist).

Response: Coordination with EN-C PDT member confirmed that the title "Wetland Strand Planting" was typed into MCACES inadvertently, intended title for this was "Wetland Planting". No corrections required.

46. EN-C- (MP)-12. MCACES, Alt.3, General. Apply comments No. 1 through 8 to Alternative #3.

Response: See responses above. See Appendix A, Engineering, MCACES, Alt.3

47. EN-C- (MP)-13. MCACES, Alt.3, Title Page 2. Narrative. Narrative for Alternative #3 is exactly the same as for Alternative #2. There's additional work on Alternative #3 than on Alternative #2. Suggest adding general description of additional work included for Alternative #3.

Response: Do not concur. One narrative was done based on alternative #3, which includes all project components. Alternatives 1 & 2 are variations of alternative 3 with

elements removed. See Appendix A, Engineering, MCACES, Alt.3, Title Page 2. Narrative.

48. EN-C- (MP)-14. MCACES, Alt.3, Summary Page 3. Page 24 of report describes Alternative #3 to clear 11.36 Acres of exotics species in Area 7 and restore with native species. Cost estimates include only 7.45 Acres. Clarify discrepancy in acreage.

Response: Concur. MCAECES estimate has been revised. See Page 24 alternative three, and Appendix A, Engineering, MCACES, Alt.3, Summary Page 2-3.

49. EN-C- (MP)-15. Main Report. Page 38. Table 3. Cost of alternatives were added \$27,500 in Real Estate Costs even though the acreage covered by each alternative varies. Is this an administrative cost that is the same for each alternative?

Response: Yes.

50. EN-C- (MP)-16. Main Report. Page 38. Table 3. Total First Cost for Alternative #1 should be \$1,432,100 and for Alternative #3 should be \$3,012,000. Total First Cost on Page 46 should also be corrected to \$3,012,000.

Response: Concur, Table 3 values have been corrected. Page 40, Table 3.

51. EN-C- (MP)-17. MCACES, Alt. 3, Detail Page 3. Verify calculations for total number of hours for laborers. Do you need .19 man-hr or .38 man-hr per plant, according to your reference, Means?

Response: Do not concur. MEANS provides labor hours as crew hour totals. Therefore, the 0.19 hrs/plant indicated in MEANS is the sum total man-hours for the crew of 2 laborers to install one plant. No changes required.

52. EN-C- (MP)-18. MCACES, Alt. 3, Detail Page 25. Verify calculations for volume of shell per 1,000 feet. Appears to the width of the trail was left out in calculations. Adjust as necessary.

Response: Concur. Current version of the MCACES has been revised. Appendix A, Engineering, MCACES, Alt. 3, Summary Page 3.

53. EN-C- (MP)-19. MCACES, Alt. 3, Detail Page 25. Verify the need of marine equipment and a crane on a job that requires surfacing of a trail. Consider including the use of a Motor Grader for grading the trail before compaction.

Response: Concur. Current version of the MCACES has been revised.

54. VK1135\_ITR-EN-TI-jdm-1. Add missing pages on plan formulation process and the missing page from the cost for the recommended plan to the report.

Response: Concur. Omissions added. See Pages 17-24.

55. VK1135\_ITR-EN-TI-jdm-2. Check elevation of fresh water lake(s) versus storm surges. The saltwater intrusion may destroy the lake shortly after construction.

Response: Do not concur. Storm surges are a risk, but are a natural disturbance event in coastal ecosystems.

56. VK1135\_ITR-EN-TI-jdm-3. Under the recommended plan, list the plan features and relate them to the recommended plan plate.

Response: Do not concur. Plan components are outlined in text and plate is clear in color. See Page 35, Plan Components and Page 23.

57. VK1135\_ITR-EN-TI-jdm-4. On Figure 8, change to color of text and line work so the plate can be read (white or yellow?).

Response: Revisions made. See Page 23.

58. VK1135\_ITR-EN-TI-jdm-5. The discussion in the EA on plans components and plant mixes need to be included under the recommended plan.

Response: The project team discussed. Plan components and species for each habitat type are included in the text and Table 1. A final detailed planting plan will be coordinated with local restoration experts by qualified Corps personnel during plans and specifications stage. See Page 24, Alternative 1-4 and Page 25, Table 1.

59. VK1135\_ITR-EN-TI-jdm-6. A certain diversity and a minimum number of plants and species need to be included in the report for each habitat type. The assumption that the cheapest plant type at the time of bid should not dictate ecosystem design.

Response: The project team discussed. Species for each habitat type are included in Table 1. A final detailed planting plan will be coordinated with local restoration experts by qualified Corps personnel during plans and specifications stage. See EA, Pages 8-10, Table 1.

60. VK1135\_ITR-EN-TI-jdm-7. Address the disposal route and the distance. How will material be transported to the disposal area?

Response: Material from pond construction will be hauled by truck approximately 1.5 miles on park and/or county roads to disposal area at north end of island. See main report Page 2.

61. VK1135\_ITR-EN-TI-jdm-8. Address the construction of the 111 project. Will we be working in the 111 borrow area at the same time the 1135 project is the area.

Response: We will not be working in the 111 borrow area at the same time. The 111 project is approximately one-half to one year closer to construction than the 1135 project since plans and specifications were completed concurrently with the 111 feasibility report. The 1135 project will not be working in the borrow area in any case.



62. VK1135\_ITR-EN-TI-jdm-9. Include a description of the recreation facilities in the recommended plan and cost estimate. Address handicap access (Federal Accessibility Requirements). This may incur a cost increase but is justifiable. Show on plate.

Response: The recreation facilities proposed as part of the recommended plan are an ADA-accessible trail and seating, both of which are discussed in detail in the main report, in the recreation appendix and shown on Figure 8. Costs for them are included in the MCACES estimates. Other existing or planned recreational facilities are or will be designed, owned and operated by the City of Miami and/or the Virginia Key Civil Rights Task Force, and as such, are outside the scope of the 1135 project. See main report Page 42, Recreation and Appendix A, summary pages.

63. VK1135\_ITR-EN-TI-jdm-10. Plants, availability, plant materials, soil amendments, etc... need to be crosschecked with someone in the industry. Refer to C-9 ERR where in water planting density was updated at lower costs.

Response: Concur. The project team has been working very closely with a DERM representative to develop plant lists for different ecotones and plant installation specifications also. See Page 24-27, Alternative 4.

64. VK1135\_ITR-EN-TI-jdm-11. Address O&MRR&R costs and activities. Address exotic species maintenance activities. Include in sponsor responsibilities.

Response: OMRR&R costs have already been calculated and included in cost-sharing calculations and non-Federal sponsor responsibilities. Such costs for exotic species maintenance activities are included in Table 4, page 39. See Page 40, Table 5.

65. VK1135\_ITR-EN-TI-jdm-12. Chipped Exotics need to be composted before being used as mulch. Address in schedule and costs. Need composting area. Otherwise, problem will impact ecosystem restoration.

Response: Concur. The project team coordinated with Ms. Catherine Johnson, CO-OA-O, (407-380-2024) to plan for composting of chipped material. Time and costs for composting have been calculated into MCACES estimates. Specific locations and timelines will be incorporated in construction plans. See Engineering Appendix, MCACES estimates.

66. VK1135\_ITR-EN-TI-jdm-13. In PMP include a design analysis report that will display the planting scheme, recreation facilities, restored earthwork and plant species. The DAR needs to be completed and design finalized prior to P&S. Add who will approve final ecosystem design. We should not leave ecosystem design up to a contractor or landscape architect.

Response: Do not concur. A PMP is not required for a Continuing Authority Program (CAP) project. The CAP utilizes the Preliminary Restoration Plan (PRP) "as a basis for an understanding among all of the involved parties of the work proposed." (1105-2-100). Note that the MCACES cost estimates contain information on the recommended planting schemes and species for each area, and addendum has been added (Note that during the ITR review it was discovered that the species listing for Freshwater Wetland plants

was omitted from Table 1, this will be corrected in the finalized report). to Appendix B, Environmental Studies, providing additional recommendations. Additionally, see main report, Table 1 for species listing by plant community type. The recreation facilities planned are depicted in Figure 8, Recommended Plan, and detailed in the MCACES cost estimates in Appendix A, Engineering. See Figure 8, page 23 Table 1, page 25, Appendix A, Engineering, and Appendix B, Environmental Studies.

CESAJ-PD-PN

21 February 2003

MEMORANDUM FOR Commander, South Atlantic Division (CESAD-CM-PE/  
Denver Austin)

SUBJECT: Virginia Key Section 1135, Ecosystem Restoration Report  
with Draft Environmental Assessment

1. Ten copies of the subject document are enclosed for your review and comment. Request comments by 31 March 2003.
2. The subject report is undergoing concurrent review with public resource agencies.
3. Questions regarding the subject report may be directed to Mark Wolff at 904-232-1125.

FOR THE COMMANDER:

Encls  
as

JAMES C. DUCK  
Chief, Planning Division

CF: CESAD-CM-P

Wolff/PD-PN/5028 *N 22 Feb 03*  
Schwichtenberg/PD-PN *BDS 1-22-03*  
Strain/PD-P *BDS for 1-22-03*  
Duck/PD *for*

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# City of Miami

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CITY MANAGER



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OCT 23 2002

Colonel James G. May, District Engineer  
U.S. Army Corps of Engineers  
South Atlantic Division  
P.O. Box 4970  
Jacksonville, Florida 32232

Subject: Section 1135 Ecosystem Restoration Project, Virginia Key, Miami-Dade County, Florida

Dear Colonel May:

The City of Miami (City) is interested in working with the U.S. Army Corps of Engineers (USACE) in the development and implementation of a Section 1135 ecosystem restoration project for portions of Virginia Key in Biscayne Bay, Miami-Dade County, Florida ("Project").

This letter formally acknowledges the City's willingness to become the non-federal sponsor for Project.

It is understood that once the federal interest in the Project is confirmed, the City would be expected, as the non-federal sponsor, to contribute twenty-five percent (25%) of the costs of implementation of the habitat restoration components of the Project, including planning and design phases (feasibility study and plans and specifications), project construction and monitoring. The present estimated costs for this aspect of the Project are \$3,325,100. The City understands that presently it would be expected to contribute \$831,275 toward this aspect of the Project.

The City also understands that it would share evenly (50 percent to 50 percent) with the federal government the costs of the ancillary recreational and educational components anticipated at the restoration site. If the costs of the recreational and educational components of the Project exceed ten percent (10%) of the costs for the total Project, then the City will be expected to pay one hundred percent (100%) of the additional costs. The present estimated costs for this aspect of the Project are \$91,500. As a result, City would

be expected to contribute \$45,800 toward this aspect of the Project. The specific ancillary recreation component plans will be fully developed jointly during the cost-shared feasibility and plans-and-specifications phases. To sum, the total present estimated total cost for this Project is \$3,416,700. According to the cost apportionment outlined above, the City would be asked to contribute \$877,075 toward the total costs of the Project.


The City understands that the restored areas would require long-term operation, maintenance, repair, rehabilitation, and replacement costs, (O & M) after initial restoration activities are completed and will be responsible for monitoring and implementation costs after the Project has been completed. Our Parks and Recreation Department would be responsible for O & M at these sites at 100 percent City expense. It is our understanding that the estimated annual O & M costs will be approximately \$32,000. The restored areas and recreation components would become important parts of the Virginia Key Beach Park restoration and the historic memorial Project plans.

We are excited about the opportunity to develop a first-rate community historic and environmental park, dedicated to the Civil Rights struggle and to the contributions of African-Americans to the South Florida area. The Project would provide the foundation for a unique federal and local government partnership that would serve as a model for other communities to follow.

Neither this letter of intent nor any reports or documents prepared by the USACE commits either agency to any level of funding for this Project. While not considered a binding contract, it is furnished to document our support for the Project and our intent to act as a local sponsor for its implementation in accordance with the requirements of local cooperation by the Army Corps of Engineers. The City of Miami is hopeful that the benefits associated with the Project will satisfy the goals of the Section 1135 program and will provide us with the opportunity to become a cost-sharing partner with the Jacksonville District, USACE in this endeavor.

We sincerely appreciate USACE assistance to date in the development of this Project and the persistent efforts provided by the Jacksonville District staff. We look forward to continued USACE support in this important project for African Americans and all citizens of the City of Miami and in the Miami-Dade County community. We are sure it would be of lasting benefit to all.

Sincerely,



Carlos A. Gimenez  
City Manager

## SYLLABUS

### RECOMMENDED PROJECT SUMMARY

Project: Sec.1135 Ecosystem Restoration, Virginia Key, Miami-Dade County, Florida

Project Purpose: Use of northern Virginia Key as a spoil disposal site for nearby Federal navigation projects caused an estimated 185 acre loss of habitat valuable to protected and rare species, including sea turtles, American crocodiles, endangered plants, native shore and wading birds and neotropical migratory birds. This habitat loss at Virginia Key is but one contribution to a large cumulative loss of such habitats in the Miami-Dade and Biscayne Bay area. The proposed project will restore four native habitats impacted by disposal of dredged material at Virginia Key (wetlands, dune/coastal strand, freshwater pond/wetlands, and tropical hardwood hammock). The recommended plan will selectively clear exotic species and replant native species in 12.5 acres of dune/coastal strand, 28.0 acres of tropical hardwood hammock, 10.2 acres of wetlands, and 3.9 acres of freshwater pond/wetlands. Additionally, another 2.1 acres of freshwater pond/wetlands will be created. The plan will restore lost ecosystem structure and function. It will help reverse the regional trend of habitat loss and degradation and promote the survival of important animal species and the ecosystems on which they depend. The restoration project is consistent with public will and plans for Virginia Key Beach Park. The project also includes an ancillary educational and recreational walking trail with interpretive signs at this significant historically African-American beach.

Benefits: Restoration of native plant and animal communities, restoration of ecological structure and function, habitat for rare, threatened and endangered species, greater educational and recreational opportunities, increased aesthetic appeal

#### Costs (Effective Date of Pricing=2005):

First Cost (Initial Construction):	\$2,166,000
Real Estate Cost (Administrative):	\$ 27,500
Total Initial Cost	\$2,193,500
Interest During Construction:	\$ 40,800
Total Investment Cost:	\$2,234,300

#### Cost Sharing:

Federal, Construction/Study	75%	\$1,833,375
Non-Federal Sponsor, Construction/Study	25%	\$ 611,125
Federal, Recreation	50%	\$ 63,250
Non-Federal Sponsor, Recreation	50%	\$ 63,250
Total Cost, Federal		\$1,896,625
Total Cost, Non-Federal Sponsor		\$ 674,375

Non-Federal Cost, O&M (annually)	100%	\$ 83,100
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**SECTION 1135  
ECOSYSTEM RESTORATION REPORT  
AND  
ENVIRONMENTAL ASSESSMENT  
VIRGINIA KEY, MIAMI-DADE COUNTY, FLORIDA**

**TABLE OF CONTENTS**

<b>I. INTRODUCTION.....</b>	<b>1</b>
LOCATION.....	1
STUDY AUTHORITY.....	1
STUDY PURPOSE AND SCOPE.....	1
<b>II. PRIOR STUDIES, REPORTS AND WATER RESOURCE PROJECTS.....</b>	<b>3</b>
PRIOR STUDIES AND REPORTS.....	3
PRIOR AND EXISTING WATER RESOURCE PROJECTS.....	5
<b>III. PLAN FORMULATION.....</b>	<b>7</b>
HISTORIC AND EXISTING CONDITIONS.....	7
FUTURE WITHOUT-PROJECT CONDITION.....	12
PLANNING PROBLEMS, OPPORTUNITIES AND CONSTRAINTS.....	12
<b>IV. ECOSYSTEM RESTORATION PROJECT GOALS AND OBJECTIVES.....</b>	<b>20</b>
FORMULATION OF ALTERNATIVES.....	21
SCREENING OF ALTERNATIVES.....	22
DESCRIPTION OF ALTERNATIVES.....	23
RATIONAL FOR SELECTING A PLAN.....	31
COMPARISON AND EVALUATION OF ALTERNATIVES.....	31
<b>V. RECOMMENDED PLAN.....</b>	<b>42</b>
PLAN COMPONENTS.....	42
PLAN DESIGN AND CONSTRUCTION.....	43
SUMMARY OF PLAN IMPACTS.....	44
PLAN COSTS.....	47
PLAN BENEFITS.....	49
PLAN EVALUATION.....	51
<b>VI. PLAN IMPLEMENTATION.....</b>	<b>54</b>
INSTITUTIONAL REQUIREMENTS.....	54
DIVISION OF RESPONSIBILITIES.....	56
SUMMARY OF COORDINATION, PUBLIC VIEWS AND COMMENTS.....	57
<b>VII. CONCLUSIONS.....</b>	<b>59</b>
<b>VIII. RECOMMENDATIONS.....</b>	<b>60</b>
<b>IX. REFERENCES.....</b>	<b>64</b>

## LIST OF TABLES

TABLE 1:	Comparison of Alternatives: Summary of Effects.....	34
TABLE 2:	Incremental Cost of Best Buy Alternatives.....	40
TABLE 3:	Summary of Costs by Alternative.....	48
TABLE 4:	Risks and Uncertainty.....	51

## LIST OF FIGURES

FIGURE 1:	Study Area Map.....	2
FIGURE 2 (a, b & c):	Important Native Ecosystems of Biscayne Bay Region.....	8
FIGURE A:	Historic aerial photographs of Virginia Key....	8.A
FIGURE B:	1965 As-Built plan for Miami Harbor, 30-foot Project.....	8.B
FIGURE C:	Aerial photograph of Virginia Key.....	8.C
FIGURE 3:	Invasion of <i>Casuarina</i> sp. (Australian Pine) on Virginia Key, 1969.....	10
FIGURE 4 (a,b & c):	Exotic Invasive Examples in Virginia Key Park Today.....	15
FIGURE 5 (a & b):	Dredged Material Disposal Area at Northern End of Virginia Key.....	16
FIGURE 6:	Location of Biscayne Bay Aquatic Preserve and Old Landfill.....	19
FIGURE 7:	Alternative 2.....	26
FIGURE 8:	Alternative 2A.....	27
FIGURE 9:	Alternative 3.....	28
FIGURE 10:	Alternative 4.....	29
FIGURE 11:	Recreation Plan.....	30
FIGURE 12:	Recommended Plan.....	41

## APPENDICES

ENGINEERING.....	Appendix A
RESTORATION VEGETATION RECOMMENDATIONS.....	Appendix B
ECONOMICS.....	Appendix C
REAL ESTATE.....	Appendix D
RECREATION RESOURCES.....	Appendix E
NEWSPAPER ARTICLES.....	Appendix F
CORRESPONDENCE.....	Appendix G
LIST OF MEETINGS.....	Appendix H

DRAFT ENVIRONMENTAL ASSESSMENT.....Green Page I

U.S. FISH AND WILDLIFE SERVICE DRAFT  
COORDINATION ACT REPORT.....EA Appendix 2, p. 1



## **DEFINITIONS OF ACRONYMS USED IN VIRGINIA KEY ECOSYSTEM RESTORATION REPORT AND ENVIRONMENTAL ASSESSMENT**

ADA	Americans With Disabilities Act
AFB	Alternatives Formulation Briefing
ASA(CW)	Assistant Secretary of the Army (Civil Works)
BBMC	Biscayne Bay Management Committee
BBRRCT	Biscayne Bay Regional Restoration Coordination Team
BEC	Biological and Environmental Consulting, Inc.
CADD	Computer Assisted Drafting and Design
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERP	Comprehensive Everglades Restoration Program
CFR	Code of Federal Regulations
COM	City of Miami
CZMA	Coastal Zone Management Act
DERM	Department of Environmental Resources Management
DO	Dissolved Oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EQ	Environmental Quality
EQB	Environmental Quality Benefit
ER	Engineer Regulation
ERR	Ecosystem Restoration Report
FDEP	Florida Department of Environmental Protection
FONSI	Finding of No Significant Impact
HTRW	Hazardous, Toxic and Radioactive Waste
HU	Habitat Units
IDC	Interest During Construction
LERRD	Lands, Easements, Rights-of-Way, Relocations, Disposal Sites
LF	Linear Feet
LPP	Locally Preferred Plan
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Units
OMRR&R	Operation, Maintenance, Repair, Rehabilitation & Replacement
PCA	Project Cooperation Agreement
PDT	Project Delivery Team
PED	Planning, Engineering, and Design
PRP	Preliminary Restoration Plan
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Office
USACE	United States Army Corps of Engineers

USFWS  
WRDA

United States Fish and Wildlife Service  
Water Resources Development Act

# **SECTION 1135 ECOSYSTEM RESTORATION REPORT VIRGINIA KEY, MIAMI-DADE COUNTY, FLORIDA**

## **I. INTRODUCTION**

### **LOCATION**

1. This report summarizes a study of ecosystem degradation problems and proposed restoration at Virginia Key, located in central Biscayne Bay in the vicinity of Key Biscayne, Miami-Dade County, Florida (See Figure 1). Included in the study are the results of planning, engineering, environmental, economic, and real estate studies of the area, its problems, and potential solutions. The purpose of the study is to determine the Federal interest in ecosystem restoration measures associated with the Miami Harbor Federal Navigation Project.

### **STUDY AUTHORITY**

2. The U.S. Army Corps of Engineers, Jacksonville District (Corps) conducted this study in response to a letter of request dated July 25, 2000 from U.S. Congress Representative Carrie P. Meek, requesting that we determine the applicability of modification measures at Virginia Key. The Corps completed a Section 905(b) Preliminary Assessment under the Biscayne Bay Feasibility Study Authority in July 2000, and the City of Miami (COM) has agreed to serve as local sponsor. [Metro-Dade Department of Environmental Resources Management expressed preliminary interest in serving as local sponsor in July, 2000 but deferred to the COM as owner of the park and restoration site.] After a site visit and further discussion of problems and opportunities, both parties agreed to pursue two studies under the Continuing Authorities Program: the first under Section 111 of the River and Harbor Act of 1968, as amended by the Water Resources Development Acts (WRDA) of 1986 and 1999, and the second under Section 1135 of WRDA 1986. The Corps completed a Feasibility Study under Section 111 and the Section 111 construction is complete.

3. This Ecosystem Restoration Report (ERR) was undertaken under authority of Section 1135 to determine the Federal interest in restoring Virginia Key ecosystems that have been degraded by past and ongoing Federal navigation project at nearby Miami Harbor. ER 1105-2-100, F-22, paragraph a., states that, "If it is determined that a Corps water resources project has contributed to the degradation of the quality of the environment, restoration measures may be implemented at the project site or at other locations that have been affected by the construction or operation of the project, if such measures do not conflict with the authorized project purposes." Dredged fill generated by the construction of Miami Harbor Federal Navigation Project (MHFNP) has resulted in the degradation of the quality of the environment associated with the MHFNP disposal area located on the north end of Virginia Key. The MHFNP dredged fill disposal site is still active and restoration is proposed at adjacent locations within Virginia Key.



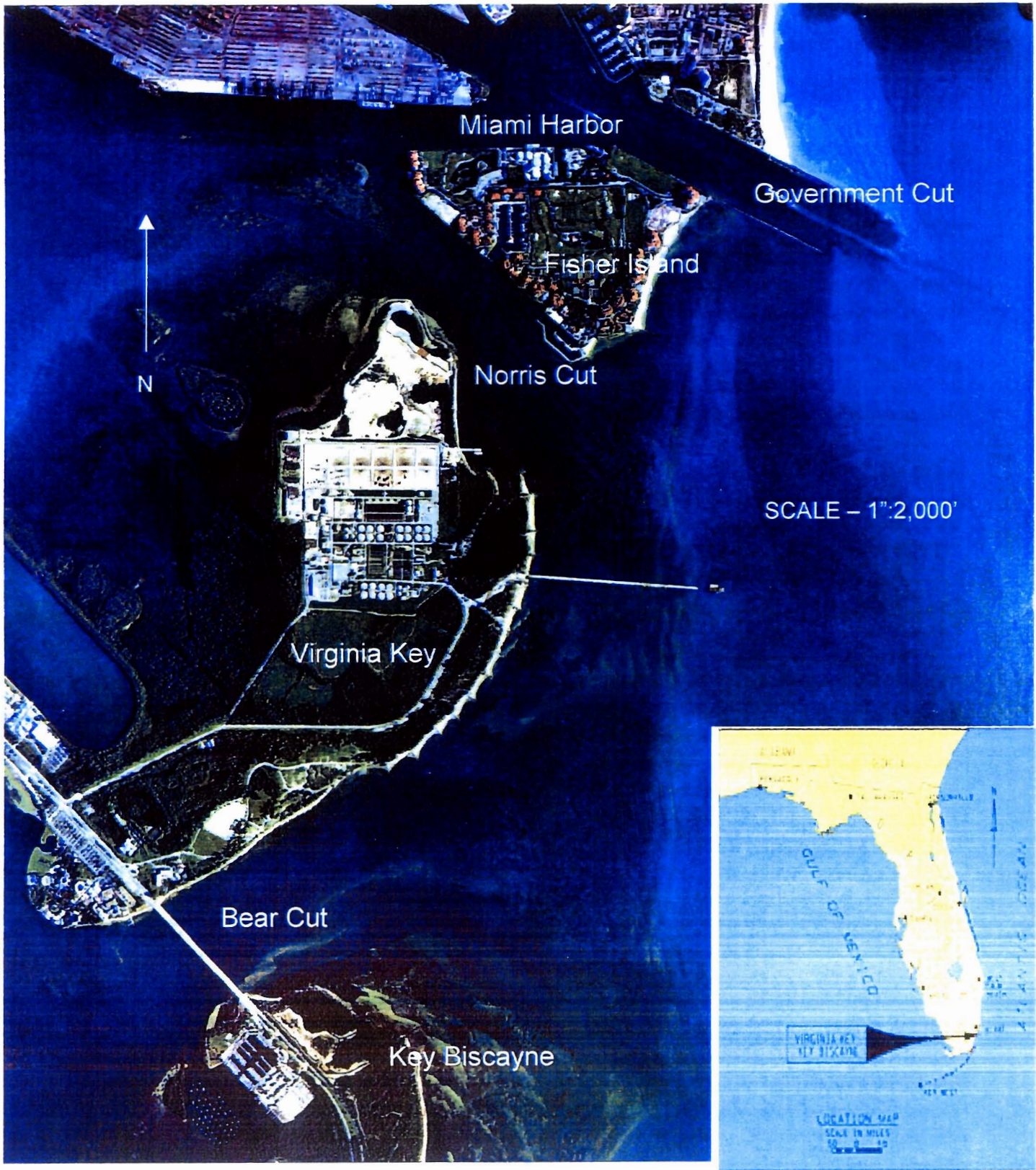


Figure 1. Study Area Map.

environment in the public interest. According to EP 165-2-502, a proposed project can be considered for funding under Section 1135 authority and undertaken where...

"...it is demonstrated that the construction or operation of an existing Corps project has contributed to the degradation of the quality of the environment. These projects do not need to incorporate features directly modifying the structures or operations of the existing Corps project. The restoration must be in the area where the degradation occurred."

#### **STUDY PURPOSE AND SCOPE**

4. The purpose of this study is to determine the feasibility of and Federal interest in restoration of coastal ecosystems on Virginia Key in central Biscayne Bay in order to improve coastal ecosystem structure and function. The study is based on the results of on-site inspections, extensive interagency coordination, engineering, economic and environmental analyses and public input. In addition to ecosystem restoration, ancillary environmental education and recreation features are proposed in order to provide experiential education opportunities for visitors to Virginia Key Beach and Park.

5. The recommended project plan is feasible and consistent with the project's primary goals and objectives, and it restores ecosystem structure and function. Ancillary recreational features do not increase the Federal share of project costs by more than ten percent, and they are not only compatible with restoration features, they also enhance the visitation experience.

#### **PRIOR STUDIES, REPORTS AND WATER RESOURCE PROJECTS**

##### **PRIOR STUDIES AND REPORTS**

6. **Biscayne Bay: Past, Present and Future.** Papers presented at this two-part public symposium in April, 1976 were subsequently published by the University of Miami and the Sea Grant program. Papers covered all known biological and ecological information about Biscayne Bay at the time, as well as managerial issues and problems. They constitute the first attempt to synthesize what was known about the Bay.

7. **Biscayne Bay Study.** This Corps study began in the early 1980's when Senate and House of Representatives authorized the Corps to review existing Federal projects to determine if modifications were advisable to alleviate water quality, biological productivity and related problems in the Bay. A Reconnaissance Report for Biscayne Bay was completed in 1984 and updated in 1995. A 905 (b) report was initially prepared under this authority that resulted in preparation of this report.

8. **Coast of Florida Erosion and Storm Effects Study.** The study was authorized by Section 104 of PL 98-360, and by resolution passed by the Committee on Public

Works and Transportation, US House of Representatives dated 8 August 1984. The study includes five major coastal regions encompassing the entire Florida coastline. The feasibility study has two specific purposes: a review of existing Federal shore protection projects to determine if modifications were warranted; and development of a comprehensive body of knowledge, information and data on coastal area changes and processes in Florida. The feasibility study was undertaken as a series of five regional feasibility reports. A Chief of Engineers report summarizing the review of the authorized Federal shore protection projects in Dade, Broward and Palm Beach Counties (Region III) was completed 27 December 1996 and included the shoreline of Virginia Key. The Chief's report is included in House Document 105-163/105/1. The Corps of Engineers only recommended one project modification, a new sand transfer plant at Lake Worth Inlet. The feasibility study for the remaining regions in Florida has not been funded for completion (Federal funds for this study were last appropriated in Fiscal Year 1996).

9. **Watson Island Park, FL.** The Committee on Public Works, US House of Representatives on September 8, 1988 authorized a shore protection study of Watson Island. Watson Island is located at the western end of Miami Harbor, adjacent to the Intracoastal Waterway. The study has not been funded to date.

10. **Miami Harbor, FL.** The Committee on Transportation and Infrastructure of the US House of Representatives passed a resolution dated October 27, 1997 requesting a review of past reports to determine the feasibility of providing channel improvements in Miami Harbor and channels. This feasibility study has not been funded.

11. **Biscayne Bay Partnership Initiative.** In 1999 the Florida Legislature created this partnership, which spent over one year assessing the status of Biscayne Bay and its natural resources. The Partnership consisted of representatives from local, state and Federal agencies, as well as community groups, universities, research institutions and private industries. A report on the Partnership's findings was published in 2001. The recommendations in the report led to the establishment later that year of the Biscayne Bay Regional Restoration Coordination Team (BBRRCT). This Team integrates and coordinates restoration, enhancement and preservation projects within the Bay to work toward a fully functional ecosystem and sustainable region.

12. **The Future Development of Virginia Key Beach Park.** This report, with recommendations to the Mayor and City Commission of Miami, was prepared in December 2000 by the Virginia Key Park Civil Rights Task Force. It presents the findings and recommendations of a City-sponsored charrette held in January 2000 to develop plans for the future development of the park.

13. **Virginia Key Shoreline Stabilization.** The Corps completed a draft feasibility study for this project in February 2002.



14. **Dinner Key Dredged Material Disposal Islands.** The Corps is currently completing a feasibility study for the restoration of aquatic ecosystems at the Dinner Key spoil islands, located in Biscayne Bay.

15. **C-102 and C-103.** The Corps has prepared a Preliminary Restoration Plan (PRP) to restore aquatic and wetland habitats adjacent to these canals, which drain to the Bay. An ecosystem restoration report is in the early phases of preparation.

16. **Comprehensive Everglades Restoration Program (CERP).** Congress authorized this large-scale ecosystem restoration. One component of the comprehensive project is the Biscayne Bay Coastal Wetland component. The Corps and the Project Delivery Team (PDT) are currently developing a Project Management Plan for the Project Implementation Report.

17. **Biscayne Bay Feasibility Study.** Lastly, the Corps is completing a study that outlines development of hydrodynamic, ecological and water quality models for use in future restoration project alternatives for the Bay.

18. **Anchorage Committee.** The Florida Department of Environmental Protection (FDEP) convened an interagency and citizen committee in 2001 in order to research methods for implementation of an anchorage in the vicinity of the Dinner Key Marina and dredged material disposal islands. The committee presented their findings and recommendations to the City of Miami in January 2002. The committee plans to provide 100 new anchorage sites, in addition to replacing inappropriate moorings currently used by some of the estimated 400 to 600 boats anchored in the area.

#### **PRIOR AND EXISTING WATER RESOURCE PROJECTS**

19. **Miami Harbor, FL.** Section 101(a) (9) of the 1990 Water Resources Development Act (WRDA) and prior acts authorized this project. It is described in House Document 105-62/105/1. The project consists of 7.7 miles in the main ship channel. The authorized depths in the main ship channel are a depth of 44 feet and a width of 500 feet in the Bar channel and a depth of 42 feet and a width of 500 feet in Government Cut. The Miami River project segment consists of 5.8 miles in length to an authorized depth of 15 feet, with widths varying from 90 to 150 feet. The project has 1.8 miles of connecting channels. The South Lummus Island Channel has an authorized depth of 42 feet and a width of 400 feet. Stone jetties north and south of Government Cut protect the main ship channel. The project also has a turning basin 1,700 feet long by 1,650 feet wide adjacent to Biscayne Boulevard. The project improvements are approximately 65 percent complete. The Federal and non-Federal implementation costs through Fiscal Year 1998 are \$45.4 million and \$24.3 million, respectively. The Federal operation and maintenance costs through Fiscal Year 1998 are \$6.3 million. The 1997 traffic was 6.6 million tons.

20. **Section 315 of WRDA 1999** authorized modifications to the Miami Harbor project. Section 315 provides authority to construct artificial reefs and related environmental mitigation required by Federal, state and local environmental

permitting agencies for the project, if the Secretary (of the Army) determines that the project as modified is technically sound, environmentally acceptable, and economically justified.

**21. Intracoastal Waterway, Jacksonville to Miami.** The Intracoastal Waterway from Jacksonville to Miami, 349 miles in length, is a major segment of the Federal inland waterway system, which serves both commercial and recreational vessels. The Fort Pierce to Miami segment provides for a channel depth of 10 feet and a width of 125 feet. The US Army Corps of Engineers maintains the waterway and side channels. The existing project was completed in 1965. Total project construction costs through Fiscal Year 1998 were \$19,251,600 Federal and \$61,000 non-Federal. Total Federal project operation and maintenance costs through Fiscal Year 1998 were \$51,858,100. The 1997 traffic was 424,000 tons.

**22. Dade County, FL.** Section 501(a) of the 1986 Water Resources Development Act and prior acts authorized the Federal hurricane and storm damage reduction project for Dade County, Florida. The project provides for restoration and periodic nourishment of 2.5 miles of shoreline at Sunny Isles and 1.2 miles of shoreline at Haulover Beach Park for storm damage reduction. The project provides for restoration and periodic nourishment of a hurricane and storm damage reduction project along 9.3 miles of shoreline from Bakers Haulover Inlet to Government Cut. The Sunny Isles, Haulover Beach Park and Bakers Haulover Inlet to Government Cut segments were initially restored in 1962, 1988 and 1982, respectively. Approximately 15.6 million cubic yards was initially placed for this project. Total project construction costs through Fiscal Year 1998 were \$55.9 million Federal and \$45.4 million non-Federal.

**23. Virginia Key, Key Biscayne, FL.** The 1962 River and Harbor Act authorized a Federal shore protection project for Virginia Key and Key Biscayne. The project is described in House Document 561/87/2. Approximately 1.8 miles of shore on Virginia Key and 1.9 miles of the northerly shore on Key Biscayne were restored in 1969 by placement of 410,000 cubic yards of sand. In 1972, 13 groins were constructed on Virginia Key to reduce sand losses. In 1974, 110,000 cubic yards were placed on Virginia Key in connection with the project deepening at Miami Harbor. The Federal and non-Federal project sponsor have spent approximately \$1,667,000 and \$715,000, respectively through Fiscal Year 1998. The Federal project was deauthorized in 1990 under the provisions of Section 1001(b)(1) of the 1986 Water Resources Development Act.

**24. Key Biscayne, FL.** The Chief of Engineers authorized a shore protection project for Key Biscayne in 1982 under the provisions of Section 103 of the 1962 Rivers and Harbor Act. The project provides for placement of 330,000 cubic yards of initial restoration and periodic nourishment of the southern 2.4 miles of Key Biscayne between the southern boundary of Crandon Park and the Cape Florida Lighthouse, and includes a terminal groin at the southern limit of the initial restoration. Project construction was completed in 1987 at a total cost of \$2.4



million. The Federal share was limited to \$1 million under the authority of Section 103. The project's terminal groin was rehabilitated following Hurricane Andrew in 1992 by replacement of 390 tons of armor stone and 280 tons of bedding stone under the authority of Public Law 84-99. This work was completed in 1994 at a cost of \$84,000.

25. **Bill Baggs Cape Florida State Recreation Area, Key Biscayne, FL.** The Chief of Engineers authorized a shore protection project for Key Biscayne in 1967 under the provisions of Section 103 of the 1962 Rivers and Harbor Act. The project provided for construction of a 283 foot-long stone revetment at Cape Florida Lighthouse at the southern end of Key Biscayne. Project construction was completed in 1968 at a total cost of \$48,000. The revetment was rehabilitated following Hurricane Andrew in 1992 under the authority of Public Law 84-99. This work was completed in 1994 at a cost of \$72,000.

#### **Miami-Dade's Department of Environmental Resource Protection (DERM)**

26. DERM has been active in restoring aquatic marine and upland habitats on several islands in central Biscayne Bay. Projects have included removal of exotic vegetation, replanting with native vegetation, vegetation monitoring and freshwater pond creation.

### **III. PLAN FORMULATION**

27. Plan formulation for the present ecosystem restoration project began in 2000 after a site visit and discussion of problems and opportunities with COM. Corps project team members worked closely with the City, local businesses, non-profits and the public to develop a plan to restore aquatic and associated upland ecosystems on Virginia Key. The Corps employs a six-step planning process to solve problems in a rational manner and make sound decisions. The six steps are: (1) identify problems and opportunities; (2) inventory and forecast conditions; (3) formulate alternative plans; (4) evaluate alternative plans; (5) compare alternative plans; and (6) select a plan.

#### **HISTORIC AND EXISTING CONDITIONS**

28. Biscayne Bay, a shallow subtropical estuary located in the southeastern part of Florida, receives freshwater from direct rainfall, surface runoff from a series of drainage canals along the western shore, and ground water seepage. A few tidal inlets serve to exchange water with the Atlantic Ocean. The dominant mechanisms of force for mixing and transport within the bay are tide and wind. The bay bottom is covered with silt and sand layers of varying depths that greatly influence the diversity of flora and fauna in various aquatic communities. (Updated Reconnaissance Report, 1995) The most extensive bay-bottom community is turtle grass with sub-components of manatee grass and shoal grass. The seagrass beds serve as a vital nursery for commercial shrimp and lobsters, and for many species of bay fishes.

29. Other communities historically part of this region include tropical hardwood or coastal hammock, coastal strand / beach dune, freshwater wetlands, salt marshes,

and mangroves (See Figure 2). These areas were important for many Bay organisms for foraging, roosting, protection from predation, and nesting.



2.a. Freshwater pond and wetland



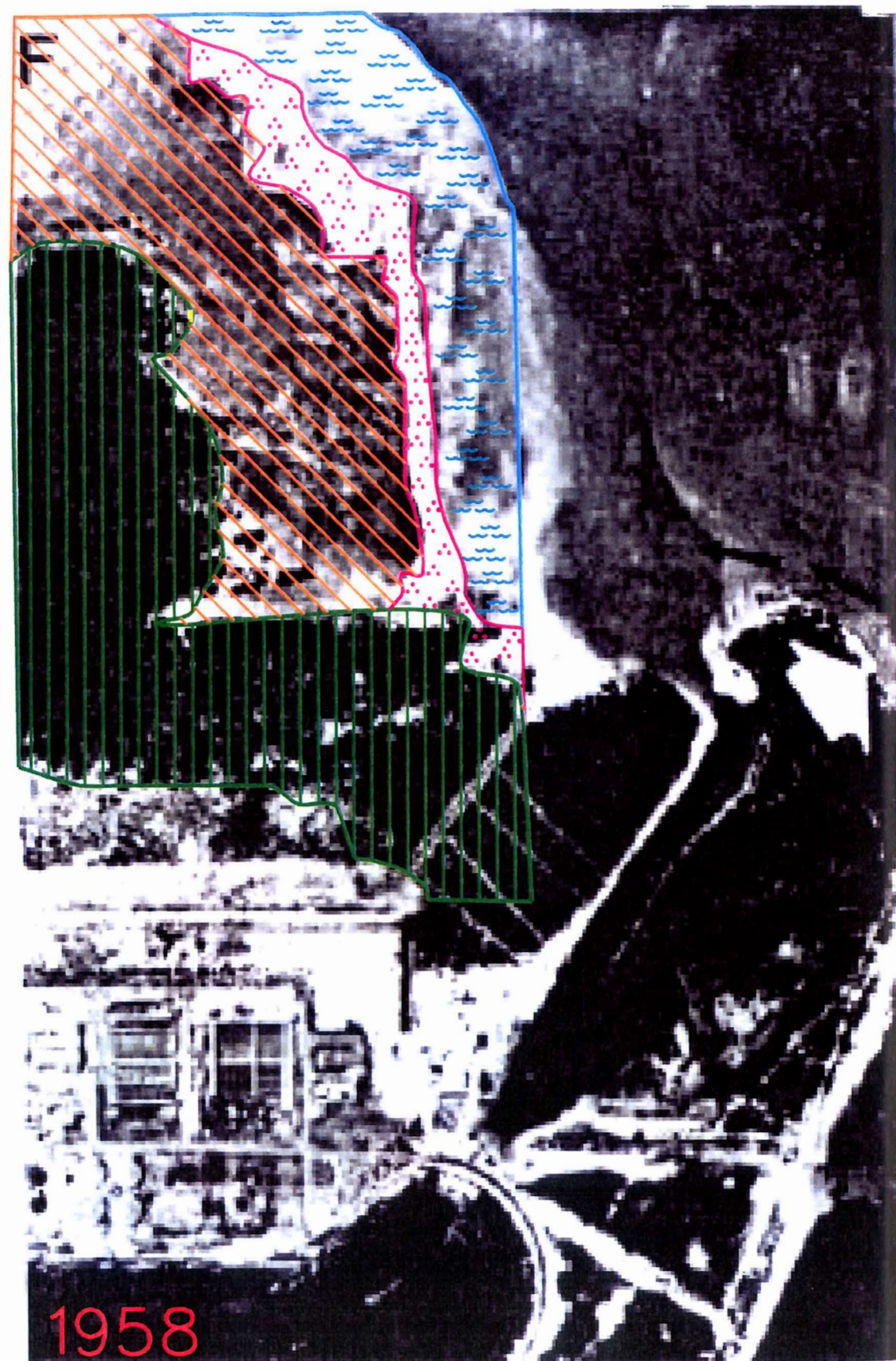
2.b. Red and Black Mangroves



2.c. Coastal Strand / beach dunes

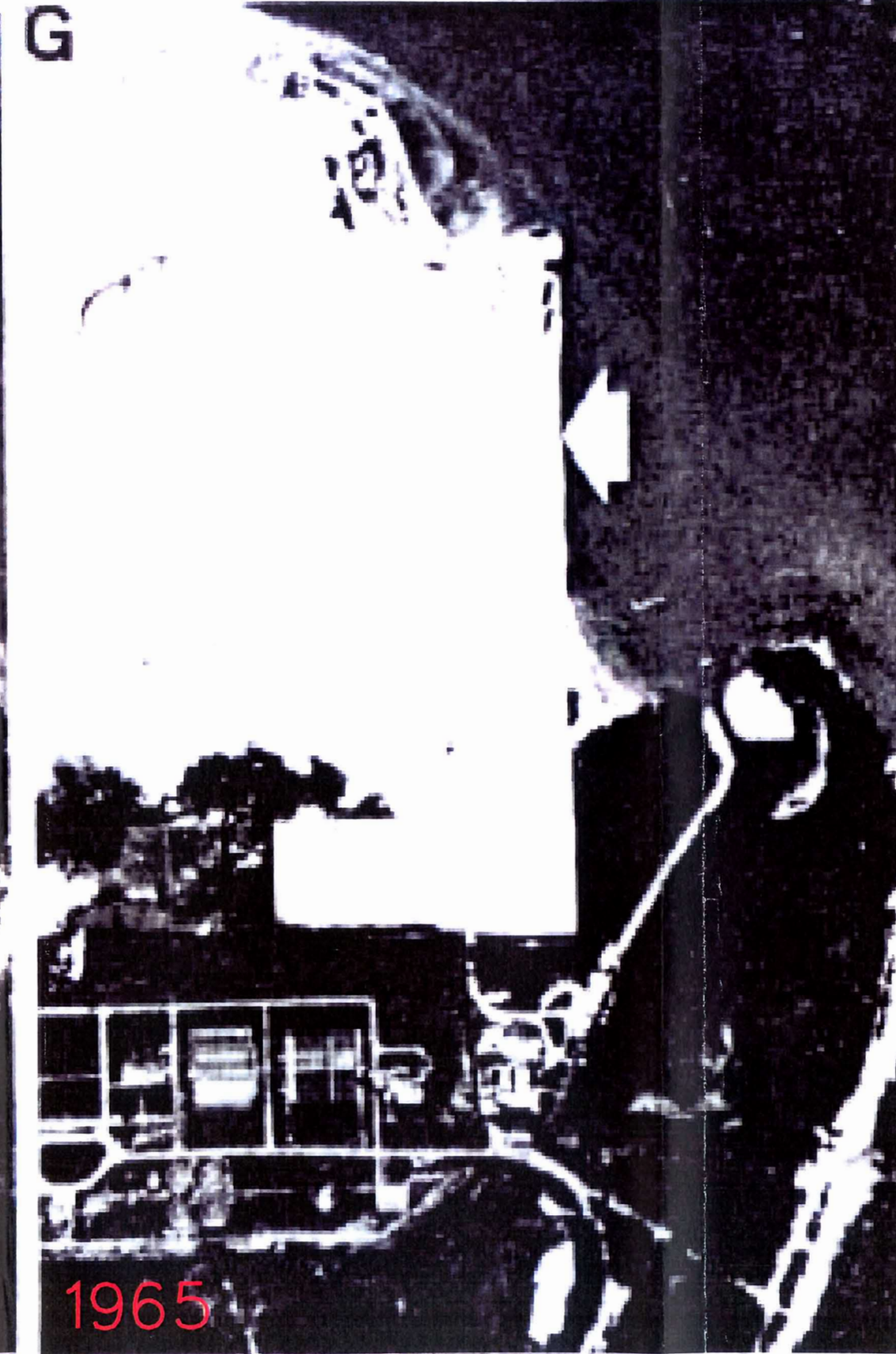
Figure 2 (a. b & c.) Important native ecosystems of Biscayne Bay region.





- Mangrove / Tropical Hardwood Hammock - 80 acres
- Dune / Coastal Strand - 60 acres
- Dry Beach - 15 acres
- Shallow Water - 30 acres

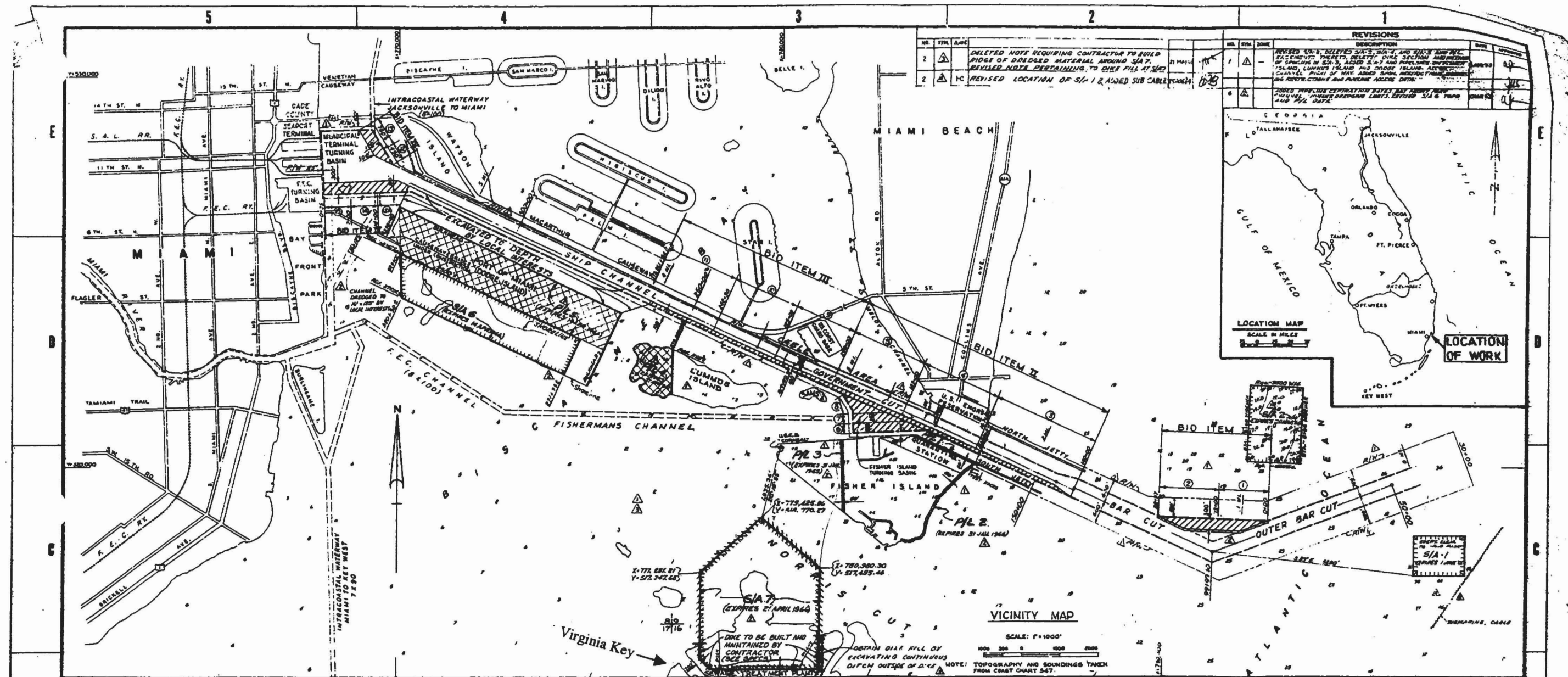
1.



2

Figure A: 1) 1958 aerial view of northeastern Virginia Key. 2) 1965 aerial view of same area showing spoil placement.





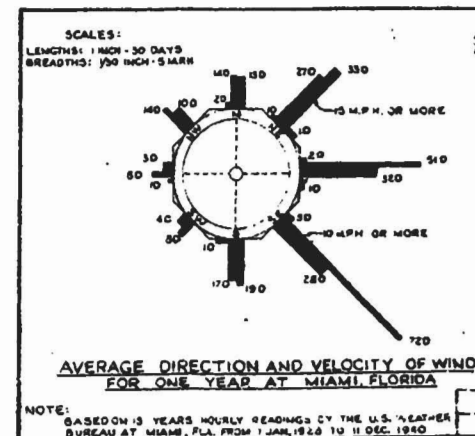
**△ SPOILING RESTRICTIONS**  
SEE SPECIFICATIONS, PART II, TECHNICAL PROVISIONS FOR RESTRICTIONS PERTAINING TO S/A 1, S/A 2, S/A 6 AND S/A 7

**△ DREDGING RESTRICTIONS**  
SEE SPECIFICATIONS, PART II, TECHNICAL PROVISIONS FOR RESTRICTIONS PERTAINING TO DREDGING NEAR BULKHEADS AND WHARVES.

**△ PIPELINE ACCESS**  
PIPELINE EASEMENTS 2 (S FISHER IS) WILL NOT BE AVAILABLE FOR USE BY CONTRACTOR UNTIL 15 SEPTEMBER 1968.

ESTIMATED QUANTITIES IN CUBIC YARDS BY BID ITEM AND ACCEPTANCE SECTIONS			
ACCEPT SECTION	SI FOOT DEPTH	ALLOWABLE OVERDEPTH	TOTAL
<b>BID ITEM 1</b>			
1	95,000	26,000	121,000
2	97,000	29,000	126,000
<b>SUB TOTAL</b>	<b>192,000</b>	<b>55,000</b>	<b>247,000</b>
<b>BID ITEM 2</b>			
3	159,000	26,000	185,000
4	157,000	23,000	180,000
5	157,000	23,000	180,000
6	163,000	33,000	196,000
7	232,000	20,000	252,000
8	202,000	16,000	218,000
<b>SUB TOTAL</b>	<b>1,070,000</b>	<b>141,000</b>	<b>1,211,000</b>
<b>BID ITEM 3</b>			
9	178,000	23,000	201,000
10	190,000	23,000	213,000
11	175,000	23,000	198,000
<b>SUB TOTAL</b>	<b>543,000</b>	<b>69,000</b>	<b>612,000</b>
<b>BID ITEM 4</b>			
12 & 12A	197,000	26,000	223,000
13	193,000	21,000	214,000
14	190,000	15,000	205,000
15	203,000	19,000	222,000
<b>SUB TOTAL</b>	<b>783,000</b>	<b>81,000</b>	<b>864,000</b>
<b>GRAND TOTAL</b>	<b>2,598,000</b>	<b>352,000</b>	<b>2,950,000</b>

INDEX OF SHEETS	
SHEET NO.	TITLE
1	INDEX AND SPOIL AREAS
2-5	PLAN
6	SECTIONS
7-8	CORE AND DRIVE BORING LOGS



REC. "Shall be" "provide" "install," "Remove," etc., and notes work was accomplished under the contract.

**LEGEND**  
DREDGING AREA  
SPOIL AREA  
PROJECT CHANNEL LIMIT  
DUE TO BE BUILT BY CONTRACTOR  
ACCEPTANCE SECTION NUMBER  
PIPELINE ACCESS EASEMENT

**AS BUILT**

APPROVED BY: [Signature]  
DATE: 5-7-68

U.S. ARMY ENGINEER DISTRICT, JACKSONVILLE  
CORPS OF ENGINEERS  
JACKSONVILLE, FLORIDA  
MIAMI HARBOR, MIAMI, FLORIDA  
20 FT. PROJECT  
WIDENING ENTRANCE CHANNEL AND TURNING BASIN  
AND DREDGING FISHER ISLAND TURNING BASIN  
INDEX AND SPOIL AREAS  
SCALE: 1"=1000'  
MAY 1968 SHEET 1 OF 7

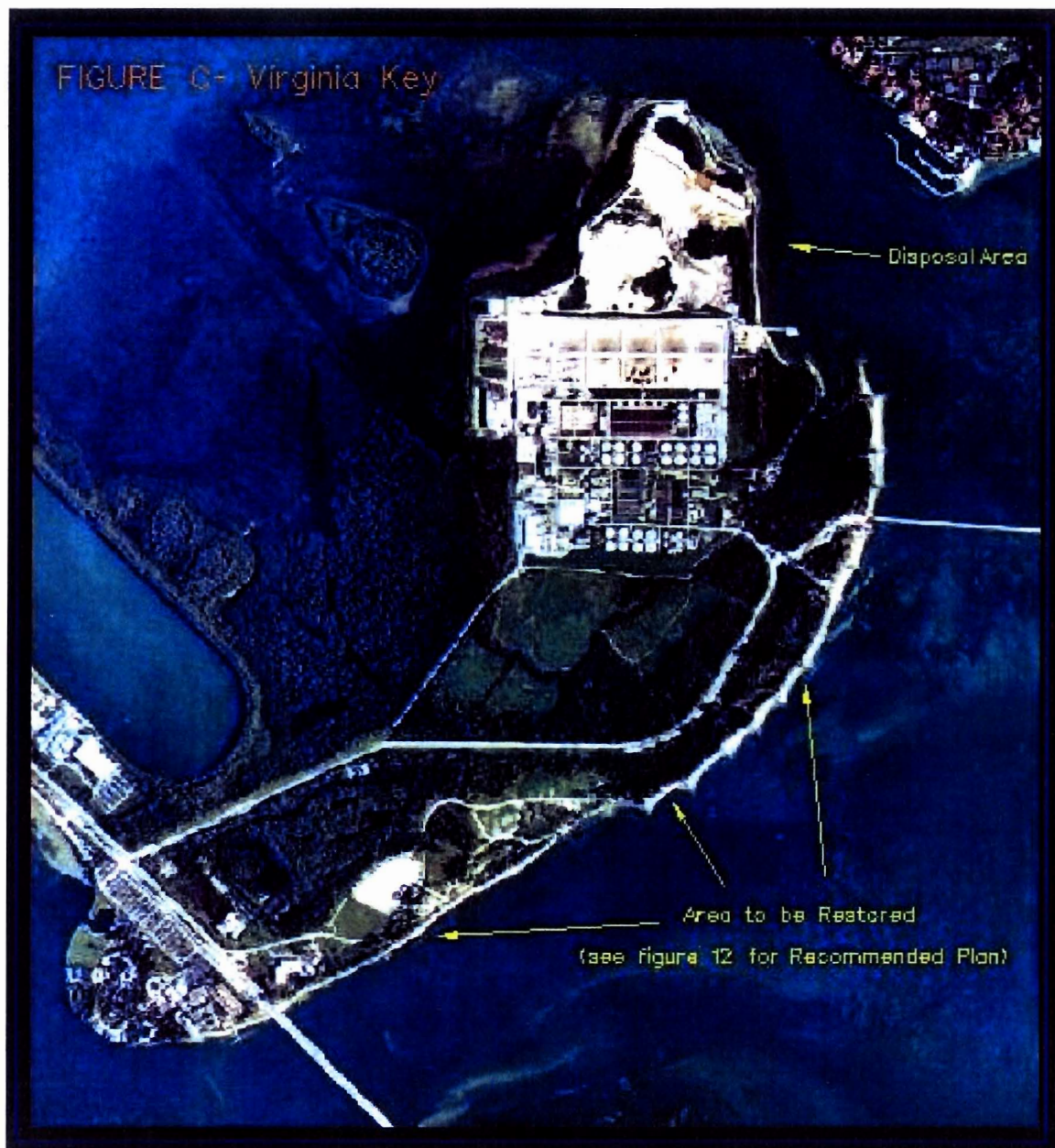


Figure C - Virginia Key

30. The development of Miami caused major modifications of natural ecosystem functions in the Bay by destroying habitat, altering water flow and circulation and by changing plant and animal community composition. Dredging of bay bottoms for beach fill, and development and construction of port facilities and channels left deep troughs in the northern portion of the bay. Causeways and sewage treatment plants empty sediment, pollutants and nutrients into the bay, making almost half of the northern bay too turbid to support benthic communities (BBRRCT, 2001). Development pressures and exotic, invasive plants have removed most coastal and associated nearshore upland habitats from much of the Biscayne Bay area.

31. Virginia Key, a natural barrier island, has approximately 2.6 miles of Atlantic shoreline and is approximately 1,000 acres in size. The island is flat, with only a few feet of natural variation in elevation above sea level. Prior to the creation of Government Cut by the Corps (authorized in 1902) and the opening of Norris cut by hurricanes, Virginia Key was contiguous to Miami Beach (DERM, 1999). Located on the island are marine stadium basin properties, an old landfill, beach and hammock areas, a shrimpers' lagoon, a wastewater treatment plant, the north point beach area and an old county park site. The State of Florida established a Critical Wildlife Area on the northwest side of the island (Task Force, 2000). It supports a high diversity of migratory birds and waterfowl.

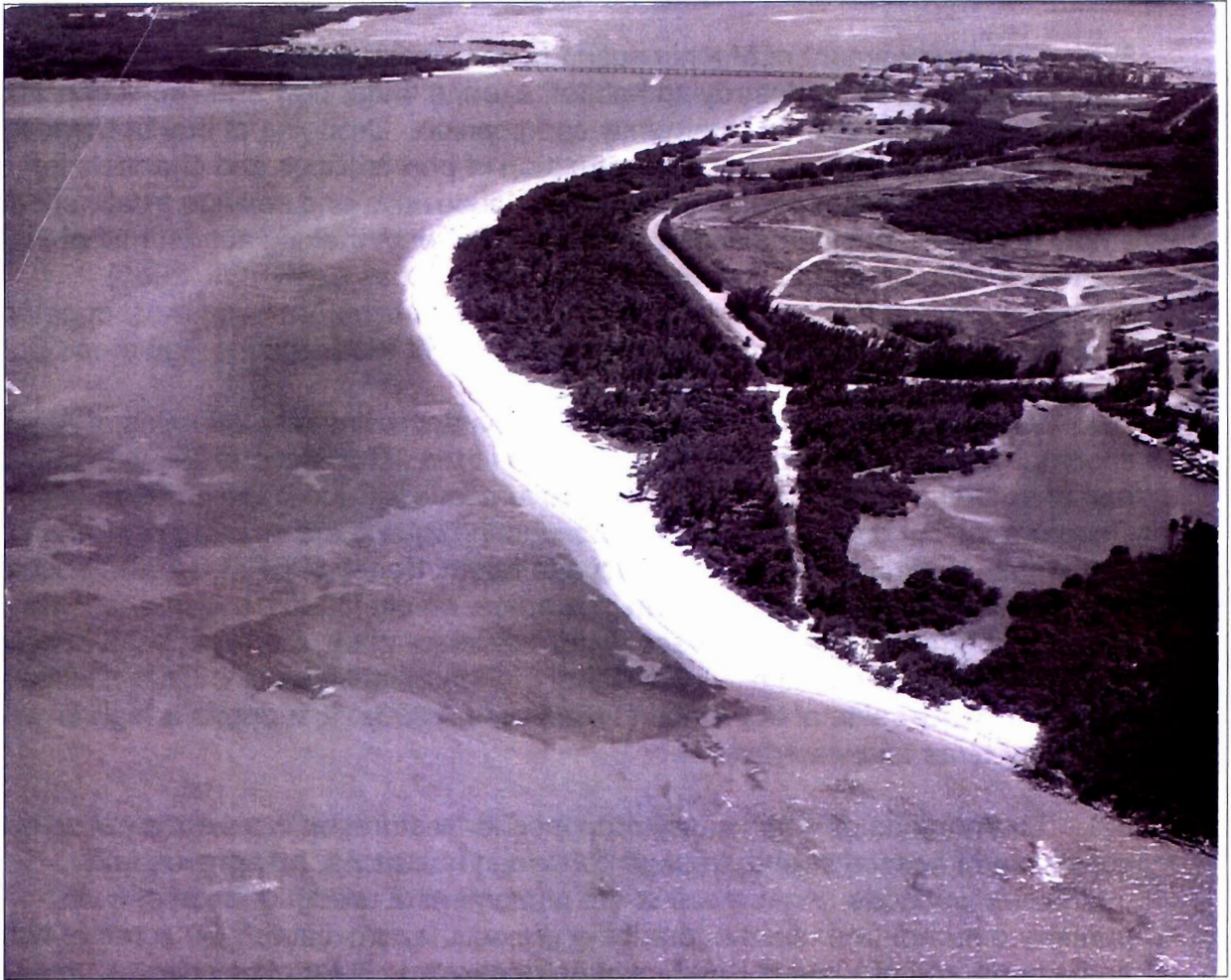
32. The portions of Virginia Key proposed for restoration were once native habitats consisting of coastal strand, tropical hardwood hammock, mangroves and freshwater wetlands. As a result of the placement of dredged material from numerous harbor and channel dredging projects, approximately 50 acres of habitat at the north end of Virginia Key has been destroyed. Natural bay depths around Virginia Key range typically between three to nine feet. (Updated Reconnaissance Report, 1995).

33. A survey of the island completed in November, 2001 revealed island elevations between zero to ten feet NGVD. Island soil consists mostly of sand and silt with shell fragments. Over the years exotic plant species invaded the island. As Figure 3 shows, some exotic species were well established by the late 1960's and have become even more problematic since. Trash and debris from nearby construction projects has been dumped and/or buried on the island.

#### **Vegetation**

34. Red mangroves (*Rhizophora mangle*), black mangroves (*Avicennia germinans*), and white mangroves (*Laguncularia racemosa*) are present intermittently along the island perimeter. Succulents such as sea purslane (*Sesuvium* sp.) and glasswort (*Salicornia* sp.), as well as sea-oxeye daisy (*Borrchia frutescens*) and saltgrass (*Distichlis spicata*) are present in parts of the coastal strand, as is seagrass (*Coccoloba uvifera*) and an occasional *Ficus* sp., spanish bayonette (*Yucca* sp.), wild lime (*Zanthoxylum* sp.), and palms. Australian pine (*Casuarina equisetifolia*) and seaside mahoe (*Thespesia populnea*) dominate the





35.  
Figure 3. Invasion of *Casuarina* sp. (Australian Pine) on Virginia Key, 1969.  
Species visible as tall, narrow wispy crowns above surrounding vegetation.

canopy in upland and coastal strand portions of the island respectively, covering approximately 80 percent of the entire acreage. In the understory, exotic invasives *Colubrina asiatica*, beach naupaka (*Scaevola sericea*), *Lantana camara*, rosary pea (*Abrus precatorius*), and several woody ornamentals, such as *Schefflera actinophylla* have begun to take over. Opportunistic grasses such as finger grass (*Eustachys* sp.) and field grass (*Paspalum* sp.) are present as groundcover.

36. Seagrasses in waters surrounding the islands include shoal grass (*Halodule wrightii*), manatee grass (*Syringodium filiforme*), turtle grass (*Thalassia testudinum*). Some species of the genus *Halophila* are present. The Federally threatened species Johnson's Seagrass (*Halophila johnsonii*) was not found in surveys of the proposed project area. This proposed restoration would not impact seagrasses directly. Best management practices will be implemented to insure that seagrasses are not impacted indirectly through construction or disturbance and erosion of soil.

#### **Wildlife Use**

37. According to FDEP's Aquatic and Coastal Preserves Section, Biscayne Bay is a major stopover point in the autumn migration of North American shorebirds. In addition, some avian species overwinter in the Bay, inhabiting shorelines and intertidal areas. Several islands in Biscayne Bay serve as bird rookeries (State of Florida, 1999). Virginia Key is likely used by shore, wading and neotropical migratory songbirds for roosting, nesting and foraging, though their presence and abundance may be limited because of predators, and because of a lack of native plant foods.

#### **Human Use**

38. Along the 2,100-ft long shoreline the COM owns a 132-acre park intended for public use. The COM acquired the park in a 1982 land swap with metropolitan Dade County. A restriction in the deed transferring ownership of the property to the City stipulates that the land be used only for public park purposes (Task Force, 2000).

39. The Virginia Key Beach Park, a 77-acre portion of the property, is of significant historical value to the African-American community in Miami. During the 1940's to 1960's, the park was the only beach African-Americans were allowed to use in Dade County. The park included, among other features, a carousel, train ride, refreshment stand and the Virginia Key Beach. It is currently under consideration for designation as a National Historic Site because of its significance as a recreational area to African Americans.

40. The northernmost portion of the 132-acre park gained national recognition as a premier windsurfing beach because of its strong winds but calm waters (Task Force, 2000). There is currently little use of the park for recreational, educational or other leisure pursuits; the COM closed the park except for special events in 1982 because of severe to moderate shoreline erosion, dangerous nearshore currents and the cost of maintaining and operating the park. In 1998 local residents began a



drive to re-open and restore the park for the education and enjoyment of all Miami-Dade's residents and visitors. The COM has begun rehabilitation of park features by connecting facilities to the city's sewer system, rehabbing an existing parking lot, a bathhouse, concession stand, carousel building, pavilions and restrooms. The park is planned to reopen to the public in Spring 2006.

#### **FUTURE WITHOUT-PROJECT CONDITIONS**

40. The island will be invaded by more exotic plants, which will provide a permanent seed source of exotic invasive species for nearby Bay islands, Biscayne Bay National Park and mainland shorelines. The site will continue to provide little to no habitat for native wildlife species. Export of detritus and nutrients to the marine community will likely decline, as existing mangrove species are crowded out by invasive species. Exotic invasive species control would be limited to areas described in the recommended plan. Other agencies are beginning control programs to treat remaining parts of the island.

41. In 1995 the COM hired Biological and Environmental Consulting, Inc. (BEC) to prepare a biological inventory and development assessment report of the coastal (tropical hardwood) hammock areas of the park. In that report BEC concluded:

It is apparent, however, that at the present rate of infestation of the severely damaged areas by lather leaf (*Colubrina asiatica*), this area may lose all of its natural biological value without a major exotic eradication and control program.

Without ecosystem restoration, ecological structure and function of coastal ecosystems will decline.

42. Finally, without the current project there will continue to be little emphasis on public environmental education or appreciation of Miami-Dade County's native habitats and natural resources at Virginia Key Beach Park.

#### **PLANNING PROBLEMS, OPPORTUNITIES AND CONSTRAINTS**

##### Problems

43. Several different problems led to the development of the local sponsor's proposal to the Corps to develop this project idea. They can be grouped into three main categories: 1) Habitat loss; 2) Invasion of exotic species; and 3) Lack of access to and understanding of Biscayne Bay's ecological resources. A brief discussion of specific elements in each category follows.

##### - Habitat Loss

44. The growth of Miami-Dade's human population since the beginning of the 20th century has caused the loss, fragmentation and degradation of many different habitats. Mangrove forests, for example, were commonly regarded as wasteland valuable only for fill and development. As a result, much of the mangrove forest that once lined the Bay's shores and barrier islands has been lost. The consequences of

this loss to Bay ecosystems are many. Most of the mangroves' annual leaf production is converted by bacteria and fungi in the aquatic ecosystem to detritus, which serves as the base of the estuarine food chain. Many species of commercially and recreationally important fish and invertebrate species depend on the structure of mangrove prop roots for protection from predation during a portion of their life cycles. Examples include snappers, groupers, lobsters and shrimp. Mangrove islands also serve as vital rookeries to many shorebirds. Mangroves help stabilize shorelines, reducing erosion and thus turbidity. Finally, because they are disturbed by only the strongest of storms, they help protect human lives and property from storm winds, waves and damage. All these functions are lost when mangroves are destroyed.

45. In addition to mangroves, freshwater ponds and marshes once covered Biscayne Bay's barrier islands and mainland shores, but they too have succumbed to urbanization and development in the last century. Such waters helped absorb excess nutrients and keep them from running off the land into the Bay. They also provided habitat for fish and shellfish and provided foraging areas for wading birds. Much of the loss of both freshwater ponds, marshes and mangroves can be attributed to shoreline hardening and island development. A study of shoreline vegetation changes by Teas et al. in 1976 found that by the 1970's vegetation along the Bay's western shoreline had mostly been replaced by seawalls and fill for development.

46. While it may not initially be thought an important component of the Biscayne Bay ecosystem, tropical (or maritime) hardwood hammocks also lined the Bay's pre-development shorelines. They are an important part of the functionally interdependent land-and-seascape of the Biscayne Bay region. They provide food and shelter for many species of birds and animals that travel between the uplands and wetlands of the Bay. These forests, always limited in area, are in need of restoration. A significant portion of such forests has been lost to development in South Florida (Snyder et al., 1990; Hartman, 1992; BBPI, 2001). In a 1995 biological inventory and report for the COM, BEC cited a 1992 publication by Johnson et al which states that only 128 acres of natural coastal area remained in Miami-Dade County, of which coastal hammock was only a small portion. BEC concluded, "...Therefore, it is clear that this habitat type in Dade County is highly endangered...." (BEC, 1995)

- Invasion of Exotic Plant Species

47. Since the beginning of European settlement in Florida, plants have been introduced to the area from other parts of the world. Enthusiastic gardeners brought some as ornamental species. Some arrived as seeds in the feathers of migratory birds. Others were introduced as agricultural species or as an effort to solve a problem such as erosion. Exotic species continue to arrive today as stowaways in agricultural imports, in ship ballast waters and in air cargo. Most such exotics don't travel far after their arrival and may eventually die off. Some species, however, when released from the constraints of competitors in their native lands, begin to

invade large areas in their new home. These exotic invasive species, as they are called, are often fast-growing, effective colonizers of disturbed and open areas. They may reproduce asexually or produce a vast number of seeds. Wind, water or animals easily spread the seeds. Seeds germinate quickly, and new exotic plants crowd out natives. They often tolerate a wide range of temperatures and growing conditions. Some release chemicals that inhibit the growth of other plant species near them. As exotic invasive species begin to replace native plants, they may disrupt ecological structure and function, reducing the ability of species in such ecosystems to adapt to changing conditions. While they may look attractive, exotic invasives may provide little valuable food for native wildlife or migratory birds. They may also have serious impacts on insect pollinators, such as butterflies, moths and bees that depend on native plant species.

48. Several exotic invasives are problematic in and around Biscayne Bay and on Virginia Key. Australian pine (*Casuarina* spp.) is one of the most invasive species in south Florida (Elfers, 1988). Not really a pine at all, this emersed hardwood was planted to form windbreaks in coastal and canal areas in an effort to alleviate flooding (Scofield, 1997). The fast-growing trees typically produce dense stands of deep shade that prohibit growth of native coastal strand and beach vegetation. They affect native species such as the cotton rat (*Sigmodon hispidus*), marsh rabbit (*Sylvilagus palustris*) sea turtles and the endangered American crocodile (*Crocodylus acutus*), all of which depend on native coastal strand and beach habitat. Australian pines offer almost no food value to most native songbirds. Finally, they also pose problems to humans. Erosion, for example, actually accelerates where Australian pines have taken over, causing loss of valuable property, as well as sedimentation and turbidity problems in the Bay. Their shallow root systems make them prone to blow downs during severe storms, in which they can block evacuation routes and cause property damage. Finally, their pollen may cause allergic reactions resulting in runny nose, eye irritation and sore throat.

49. Other exotic invasive species present on Virginia Key are seaside mahoe (*Thespesia populnea*), lather leaf (*Colubrina asiatica*), Half-Flower (*Scaevola sericea*) and Brazilian pepper (*Schinus terebinthifolius*). Like Australian pine, all shade out or, in the case of lather leaf, physically engulf native plant species. Brazilian pepper may have a narcotic or toxic effect on birds and wildlife that eat its seeds (Elfers, 1988). All of these species are on Miami-Dade County's list of species prohibited by law or not recommended for planting (Dobson). See Figure 4 for examples of exotic invasion on Virginia Key today.

- Lack of Access to and Understanding About Biscayne Bay's Ecological Resources

50. The lack of public awareness, understanding, and appreciation of Bay resources has been cited by many governmental and interagency groups as a problem for continued public will to protect the exceptional treasures the Bay retains



4.a. *Scaevola sericea* has taken over all other coastal strand vegetation along this portion of the beach.



4.b. *Casuarina equisetifolia* in dense stand shading and crowding out native vegetation



4.c. *Colubrina asiatica* overgrowing other vegetation in degraded tropical hardwood habitat

Figure 4 (a, b & c). Exotic invasive examples in Virginia Key Park today





Figure 5a. North end of the disposal area, looking north over sand and gravel area. Fischer Island in background, beyond Norris Cut.



Figure 5b. Western side of disposal area, looking northeast over sand and gravel area.

Figure 5 (a & b). Dredged material disposal area at northern end of Virginia Key.

and to restore those already degraded. Miami-Dade's Biscayne Bay Management Plan, adopted in 1981, identified as one of its major concerns the need for more marine-oriented recreational facilities and for improved physical access to the Bay (Markley). While the plan's primary goal is to manage the Bay system in a manner that maintains and enhances the Bay's ecological integrity, it recognizes the need for local residents to know and appreciate the Bay's resources if those resources are to be protected. A 1986 report by the Biscayne Bay Management Committee (BBMC) recognized the same need and recommended that Dade County schools provide a comprehensive program to teach students the importance of and respect for the Bay's sensitive natural resources (BBMC, 1986). A consensus document, produced at a 1976 symposium on Biscayne Bay management, while recognizing the need for access and education, recommended that such access be focused on opportunities in which preservation of the resource was the first criterion, along with the ability to manage public use of the facility and minimize overall impact to the Bay. Finally, the Biscayne Bay Partnership Initiative, convened by the Governor in 1999, recommended in their final report that educational efforts be expanded.

#### Corps Role in Habitat Loss

51. While it is unclear exactly how much and what kind of habitat was destroyed by dredged material disposal from Corps projects at the north end of Virginia Key, it is clear that native habitats were lost. Figure 5 shows a contemporary view of the disposal area and the lack of habitat it provides for most species. Based on available information and historic maps, it is likely that mangroves, seagrasses, coastal strand, and potentially tropical hardwood hammock were impacted.

#### Opportunities

##### ○ Ecological Benefits

52. The current situation presents exciting and beneficial opportunities for betterment of both Biscayne Bay habitats and their wildlife and human inhabitants. Restoration of ecosystems with native species will provide not only greater ecological function, but also more protection from storm winds and waves than an ecosystem dominated by Australian pines. Restoration of native ecosystems on Virginia Key will provide ecological functions to the Bay that were lost to development on the nearby mainland shoreline, where restoration is no longer an option. It provides an opportunity to turn habitats that have had a negative effect on the Bay ecosystems into habitats with positive effects. After restoration, the island will help further the mission of the Biscayne Bay Aquatic Preserve (to which it is adjacent), rather than detract from it.

##### ○ Public Access and Education

53. Restoration of the old park lands, clean up of trash and debris and an environmental education component will provide enhanced public use of the city's property. It will also provide experiential education on Biscayne Bay and its associated ecosystems to minority residents and visitors, many of whom may have had little access to such experiences in the past. Virginia Key Park is in an ideal

location; it is easily visible and accessible to thousands of residents and visitors in the heart of downtown Miami, but isolated enough to provide habitat attractive to a variety of terrestrial, avian and marine fauna. It is, in fact, the only City-owned land on the Atlantic Ocean (Task Force, 2000). The mix of ecological and sociological benefits will aid implementation of many recommendations of the BBPI and BBRCT.

54. As local sponsor, the COM has informed the Corps that it has funding currently available to re-vitalize the existing restrooms at the Virginia Key beach recreation area without the Corps' participation. The City wants to begin work on this rehabilitation effort soon. From a cost-sharing viewpoint, the COM wants the Corps to participate with the construction of the trail system, removal of exotic vegetation and installation of interpretive signs as proposed in the ERR.

- Public Will

55. In addition, the restoration and educational features proposed are consistent with and will complement the findings and recommendations of a public charrette held by the Virginia Key Park Civil Rights Task Force (Task Force) in January 2000. The Miami City Commission created the Task Force in 1999 to advise and make recommendations to the City Commission on the future development of Virginia Key Park. The Task Force was created in response to public outcry over City plans to lease part of the old Virginia Key Park to private developers for construction of an upscale private "eco-campground" resort. Widespread public condemnation of the City's private development plans, along with corresponding support for a combination of environmental protection and public use of the park is evidenced in newspaper articles and editorials from that time period (See Appendix F).

#### Partnerships

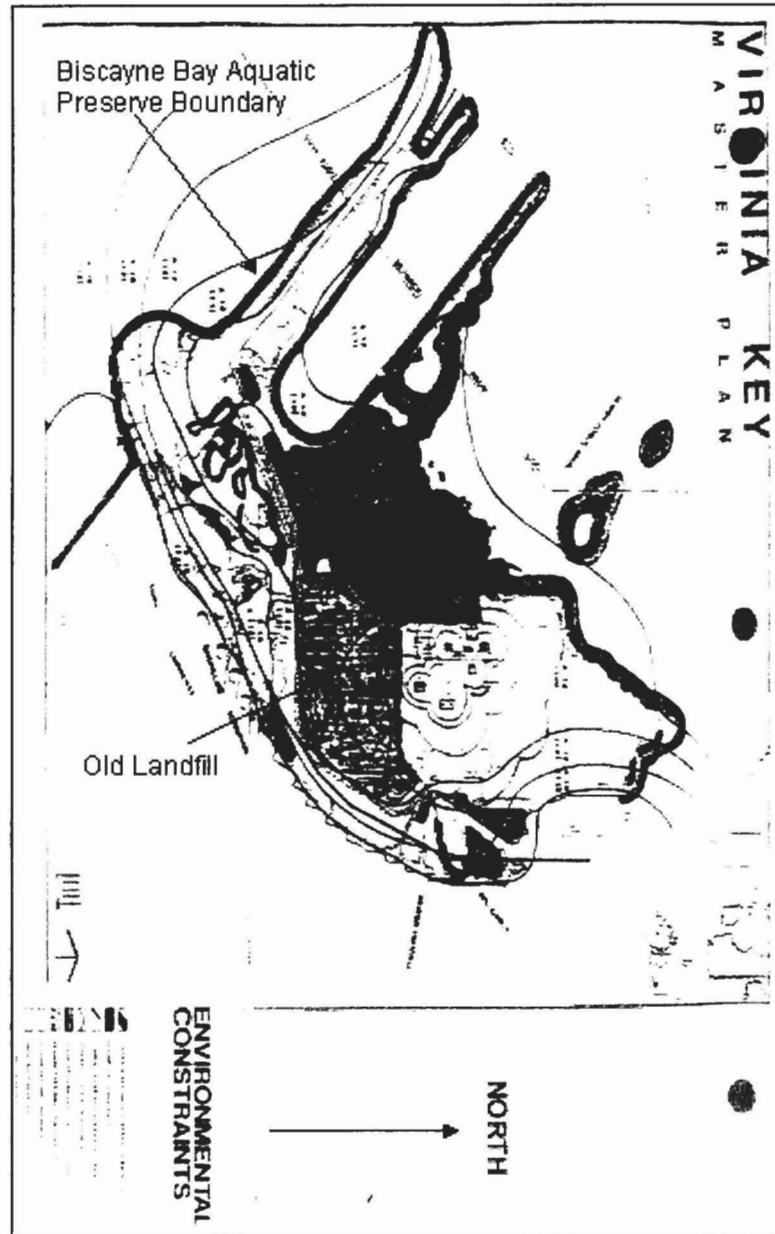
56. Finally, the proposed project presents an opportunity to combine Corps engineering expertise with ecological knowledge and restoration experience of local experts in the City and County in order to restore important coastal ecosystems.

#### Constraints

- Biscayne Bay Aquatic Preserve

57. The western shoreline of Virginia Key is located along the boundary of Biscayne Bay Aquatic Preserve (See Figure 6), which was established by the Florida legislature in 1974. Because Biscayne Bay is judged to have exceptional biological, aesthetic and scientific value, it is to be set aside forever for the benefit of future generations. As an aquatic preserve, Biscayne Bay is managed by FDEP, who monitor and review projects that may impact the preserve's resources. Though the proposed restoration project is outside the Preserve boundary, the project delivery team (PDT) will need to insure the restoration project is carried out in a manner consistent with the Preserve's management plan in order to avoid negative impacts to the Preserve.

Figure 6. Location of Biscayne Bay Aquatic Preserve and Old Landfill





- Old Landfill

58. An old public dump/landfill lies on 120 acres of land just south of the sewage treatment plant and west of the park restoration boundary (See Figure 6 on previous page). Its contents of incinerator ash, plant trimmings, sludge and unrestricted trash are not expected to impact restoration plans directly. Because of the potential presence of hazardous or toxic waste, however, the landfill's presence does limit the extent of restoration possible in that portion of the park.

- Restoration Cost

59. Finally, restoration of coastal ecosystems on islands can be relatively expensive. The City of Miami, the project's local sponsor, has consistently operated with budget deficits in recent years; therefore, local sponsor funding for their portion of project costs may be too limited to achieve all project objectives simultaneously. The Federal-funding limit of \$5 million per project may also be a limitation.

#### Conclusion

60. Use of northern Virginia Key as a spoil disposal site for nearby Federal navigation projects has clearly caused loss of habitats valuable to many protected and rare species, including sea turtles, American crocodiles, endangered plants, native shore and wading birds and neotropical migratory birds. This loss of habitat at Virginia Key is but one contribution to a large cumulative loss of such habitats in the Miami-Dade and Biscayne Bay area. This proposal to restore native habitats previously lost would help reverse the regional trend and promote the survival of many important animal species and the ecosystems on which they depend. In addition, the restoration project as proposed would be consistent with public will and public plans for the Virginia Key Park.

### **IV. ECOSYSTEM RESTORATION PROJECT GOALS AND OBJECTIVES**

61. The Corps of Engineers incorporated ecosystem restoration as a project purpose within the Civil Works program in response to increasing national emphasis on environmental restoration and preservation. The objective of ecosystem restoration is to restore degraded ecosystem structure, function and dynamic processes to a more natural condition. Restored ecosystems should mimic, as closely as possible, conditions which would occur in the area in the absence of human changes to the landscape and hydrology. Ecosystem restoration can be directed at different sized ecosystems within nested sets, and may encompass multiple states, localized watersheds, or a smaller complex of habitats.

62. The goals of this ecosystem restoration project are:

- Goal 1: to restore native coastal ecosystems in all sponsor-controlled areas on Virginia Key that were impacted by the operation of the Federal navigation projects at Miami Harbor and associated channels.

- Goal 2: to increase public appreciation of and willingness to protect native southeast Florida ecosystems.

63. In order to achieve these goals, the proposed ecosystem restoration project has four objectives.

- Objective 1: To remove exotic, invasive vegetation from Virginia Key.
- Objective 2: To plant native species appropriate to the four coastal habitats present — dune/coastal strand, tropical hardwood hammock, wetlands, and pond with fringing wetlands — in a large inter-connected mosaic of habitats, using appropriate structural layers and densities. For the purposes of this project “pond with fringing wetlands”, or “pond with wetlands” refers to freshwater areas near the center of the island. “Wetlands” refers to brackish wetland strand habitat near the shoreline that is affected by the tide.
- Objective 3: To improve the existing freshwater aquatic habitat and create additional freshwater aquatic habitat.
- Objective 4: Provide native coastal ecosystem education and recreation opportunities at Virginia Key Park through creation of a walking trail through all restored ecosystems. Trail shall include educational signs interpreting ecological features and the historical contributions of minorities to environmental protection.

#### **FORMULATION OF ALTERNATIVES**

64. The study team and sponsor conducted plan formulation in three phases by: 1) identifying potential management measures; 2) formulating alternatives by mixing and matching management measures; and 3) reformulating plans in an iterative manner, whereby measures were added, dropped, re-scaled and otherwise modified to better achieve planning objectives or stay within the limits of one or more constraints.

65. During the first phase alternatives developed included traditional types of Corps projects, projects that could be implemented by non-Federal interests and measures suggested by the non-Federal sponsor as well as public meeting or workshop participants. Costs and benefits were not calculated. Study team members screened each plan based on its ability to satisfy ecosystem restoration planning objectives. The team then analyzed viable plans at the intermediate level of analysis, developing each sufficiently to assess project benefits, costs and impacts. Finally, only those plans meriting detailed evaluation were carried on to the third level of alternative formulation. This process insured that all possible ecosystem restoration alternatives were formulated in a systematic and reasonable manner.

## **SCREENING OF ALTERNATIVES**

66. The study team considered many possible solutions in the first phase of plan formulation. The following options were eliminated prior to the intermediate phase of analysis.

67. The team considered re-establishing permanent tidal connections between mangroves on the western side of the island and tidal connections on the eastern side of the island. The study team learned that construction of the necessary connections would be complicated by the presence of large water and sewer lines along the road to the Virginia Key sewage treatment plant and hence prohibitively expensive. The study team and sponsors discussed and subsequently eliminated this alternative from further consideration.

68. The team considered establishing permanent hydrologic connections between mangrove areas near the eastern shore of the island and the ocean. This potential management measure was eliminated because of the damage it would do to the coastal strand community, sea turtle beach nesting habitat, and nearshore seagrass habitat. In addition, construction of such connections would be difficult and expensive to maintain.

69. Removal of exotic vegetation without replanting of native species was considered. This alternative would only temporarily remove exotic species, creating ideal conditions for immediate re-invasion by the same exotic species. It would also provide only minimal ecosystem restoration. Finally, it would fail to provide an ecosystem-based environmental education and recreation opportunity for minority residents and visitors.

70. The study team considered purely non-structural options to achieve project goals and objectives. They included such measures as enhanced enforcement of existing local and state laws governing use of public lands, littering and disposal of debris. Enforcement of local laws is not within the jurisdiction of the Corps, and as such, is not an implementable solution. In addition, purely non-structural alternatives would fail to achieve restoration project goals and objectives. For these reasons, non-structural options were not considered further.

71. Removal of fill material from the mangrove community adjacent to the western side of the sewage treatment plant was considered. This measure was eliminated because it was so far removed from the park and the rest of the areas to be restored, and because the National Oceanic and Atmospheric Administration (NOAA) expressed interest in restoring the area for mitigation purposes.

72. During the intermediate phase of alternative formulation, the team and sponsor focused on alternatives that could provide coastal ecosystem restoration benefits, in addition to the educational and recreational features desired by the local sponsor. At the same time, the significance of the ecosystems to be restored, as

established through legal, institutional, scientific and public recognition, was documented.

## **DESCRIPTION OF ALTERNATIVES**

73. The study team, sponsor, members of the public and government agencies worked together to identify alternatives to accomplish the coastal ecosystem restoration objectives. Combining desirable management measures in different ways resulted in four alternatives that would restore communities native to Biscayne Bay and meet all the project objectives. In addition to these, the alternative of doing nothing was also considered.

### **Alternative 1: No Action Alternative**

74. If the project is not performed, the site will continue to have exotic plant encroachment and experience greater loss of environmental values. Benefits from past partial restoration would be lost. If this project is not implemented, debris will continue to pile up and clutter the islands, further reducing ecological functions. The no action alternative is not a viable option.

### **Alternative 2: Lower Key Restoration**

75. This alternative would selectively clear exotic vegetation and replant with native species within the boundaries of the Virginia Key Beach Park. A total of 3.2 acres of pond with wetlands, 0.7 acres of wetland, 8.2 acres of dune/coastal strand, and 24.2 acres of tropical hardwood hammock habitat would be restored in areas identified on the map in Figure 2.

### **Alternative 2A: Lower Key Restoration w/ new wetland**

76. This alternative would selectively clear exotic vegetation and replant with native species within the boundaries of the Virginia Key Beach Park, and create 2.1 acres of new freshwater pond with wetland habitat. A total of 5.3 acres of wetlands, 0.7 acres of wetland, 2.1 acres of freshwater pond with wetlands, 8.2 acres of dune/coastal strand, and 22.1 acres of tropical hardwood hammock habitat would be created/restored in areas identified on the map in Figure 3.

### **Alternative 3: Middle Key Restoration**

77. This alternative would selectively clear exotic vegetation and replant with native species in the middle section of the island, just north of Virginia Key Beach Park. A total of 6.6 acres of wetlands, 3.4 acres of dune/coastal strand, and 9.2 acres of tropical hardwood hammock habitat would be restored in areas identified on the map in Figure 4.

### **Alternative 4: Upper Key Restoration**

78. This alternative would selectively clear exotic vegetation and replant with native species in the northern section of the island. A total of 2.1 acres of dune/coastal strand, and 1.5 acres of tropical hardwood hammock habitat would be restored in areas identified on the map in Figure 5.

79. Regardless of the alternative(s) chosen, exotic invasive vegetation to be removed from the island includes Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), Burma reed (*Neyraudia reynaudiana*), seaside mahoe (*Thespesia populnea*) Lather Leaf (*Colubrina asiatica*) and beach naupaka (*Scaevola sericea*). Selective clearing would be accomplished in one of several ways; (1) cut, herbicide, chip and mulch in place; (2) cut, chip and mulch in place; (3) cut and haul off site; (4) cut, chip and haul off site; or (5) cut and burn on site. Regardless of the method chosen, it must result in the elimination of the exotic species seed source to prevent re-invasion of the islands and other near-shore and island habitats around Biscayne Bay. During clearing one or more qualified people, knowledgeable in identification of coastal upland and wetland plants and ecosystem restoration, would be present to insure that only exotic invasive species are removed. Native species to be planted are listed in Appendix B.

80. Each restoration alternative includes significant investment in planting of native plant species. When restoring ecosystems, it is critical to ensure that native hydrology is present or restored, that topography is natural or restored and that contaminant loads are absent or reduced. The final step in restoration is reestablishment of native biota (NRC, 1992). This generally involves aiding establishment of the native plant community. The native plant community provides the structure critical to re-development of ecosystem function. Planting a large number of native plant specimens is critical in an ecosystem restoration project such as this for several reasons. First, an area that is only cleared of exotics provides very little nesting or foraging habitat, shelter or cover for native species and likely will not do so for many years. Second, in cases such as this one, in which exotic vegetation has virtually engulfed many of the remaining native plants, planting of an appropriate density (given in Appendix B) of native vegetation is essential to preventing re-invasion by exotics. Many invasive exotic species are extraordinarily effective colonizers of open, disturbed areas with little or no vegetation. Many native plant species of the ecosystems to be restored are not. Therefore, by planting native species one provides a head start to natives, thereby helping to establish natives and prevent re-invasion of exotics.

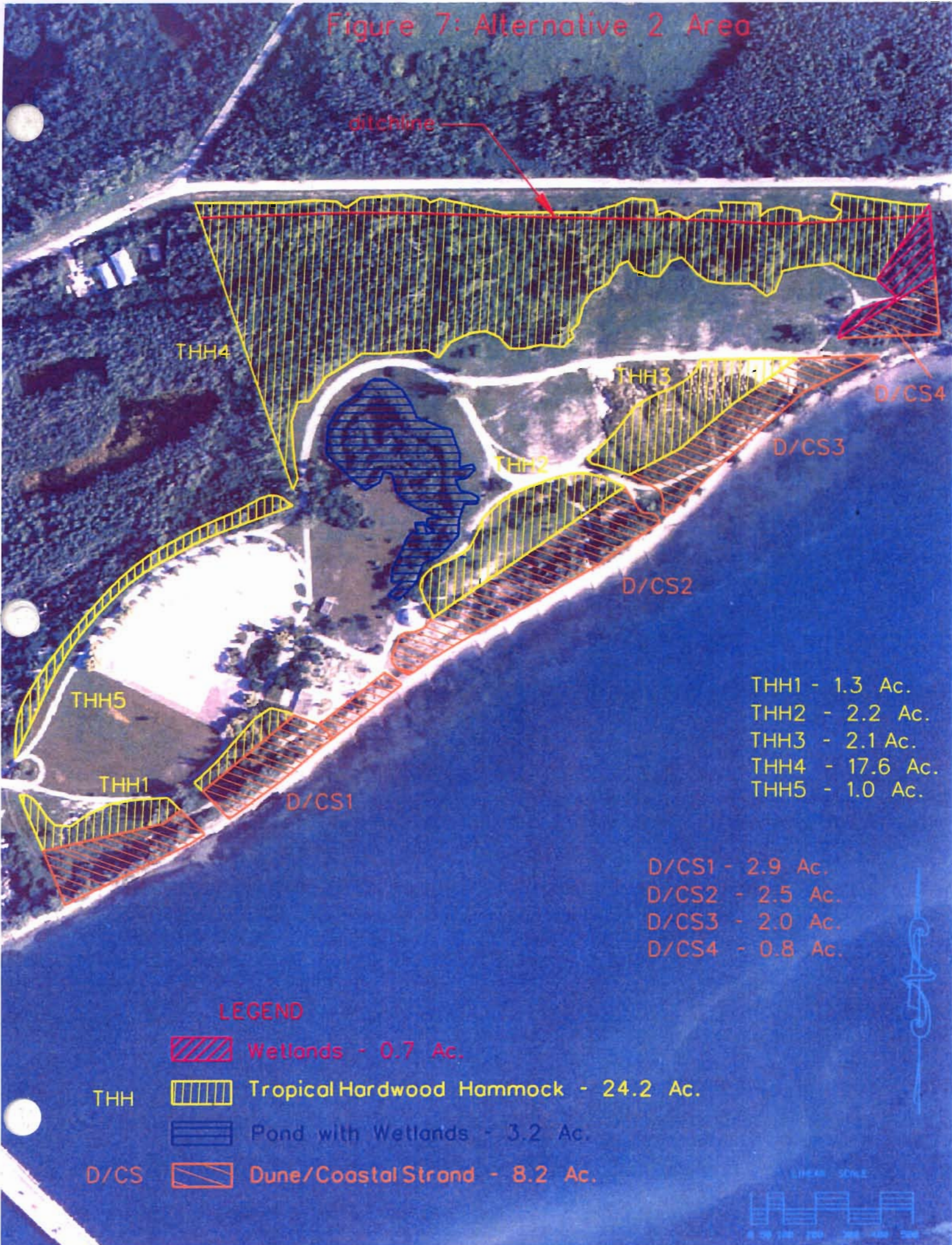
81. Finally, the plant materials and their dimensions have been selected to provide the minimum ecosystem restoration components that will provide the most habitat value for the installation cost. The vegetative materials selected will provide overstory, understory and groundcover layers essential to a productive and functioning habitat. The proposed plant materials would be developed enough upon installation to establish themselves with minimal additional attention after completion of a forty-five day watering contract. Any cost savings gained by purchase of smaller plants would be offset by lower survival rates and the cost of replanting. See Table B-2 in Appendix B for a detailed list of native plant species suitable for ecosystem restoration on Virginia Key.

82. The recreational component includes ancillary educational and recreational features which extend environmental education opportunities to Virginia Key Park's

visitors. They include interpretive walking trails appropriate for children and adults and educational signs identifying restored habitats and species. In addition, signs summarizing the contributions of African Americans and other minorities to the environmental movement in the United States are proposed to complement the historical focus of the park. As required under Section 1135 authority, all features would be compatible with and enhance the ecosystem restoration, total less than 10% of the Federal cost, and would be cost-shared at a ratio of 50% federal to 50% local funds. The trails will also provide vehicular and equipment access to restoration sites for vegetation monitoring and maintenance by the local sponsor.



Figure 7: Alternative 2 Area



THH1 - 1.3 Ac.  
 THH2 - 2.2 Ac.  
 THH3 - 2.1 Ac.  
 THH4 - 17.6 Ac.  
 THH5 - 1.0 Ac.

D/CS1 - 2.9 Ac.  
 D/CS2 - 2.5 Ac.  
 D/CS3 - 2.0 Ac.  
 D/CS4 - 0.8 Ac.

LEGEND

-  Wetlands - 0.7 Ac.
- THH  Tropical Hardwood Hammock - 24.2 Ac.
-  Pond with Wetlands - 3.2 Ac.
- D/CS  Dune/Coastal Strand - 8.2 Ac.





Figure 8: Alternative 2A Area

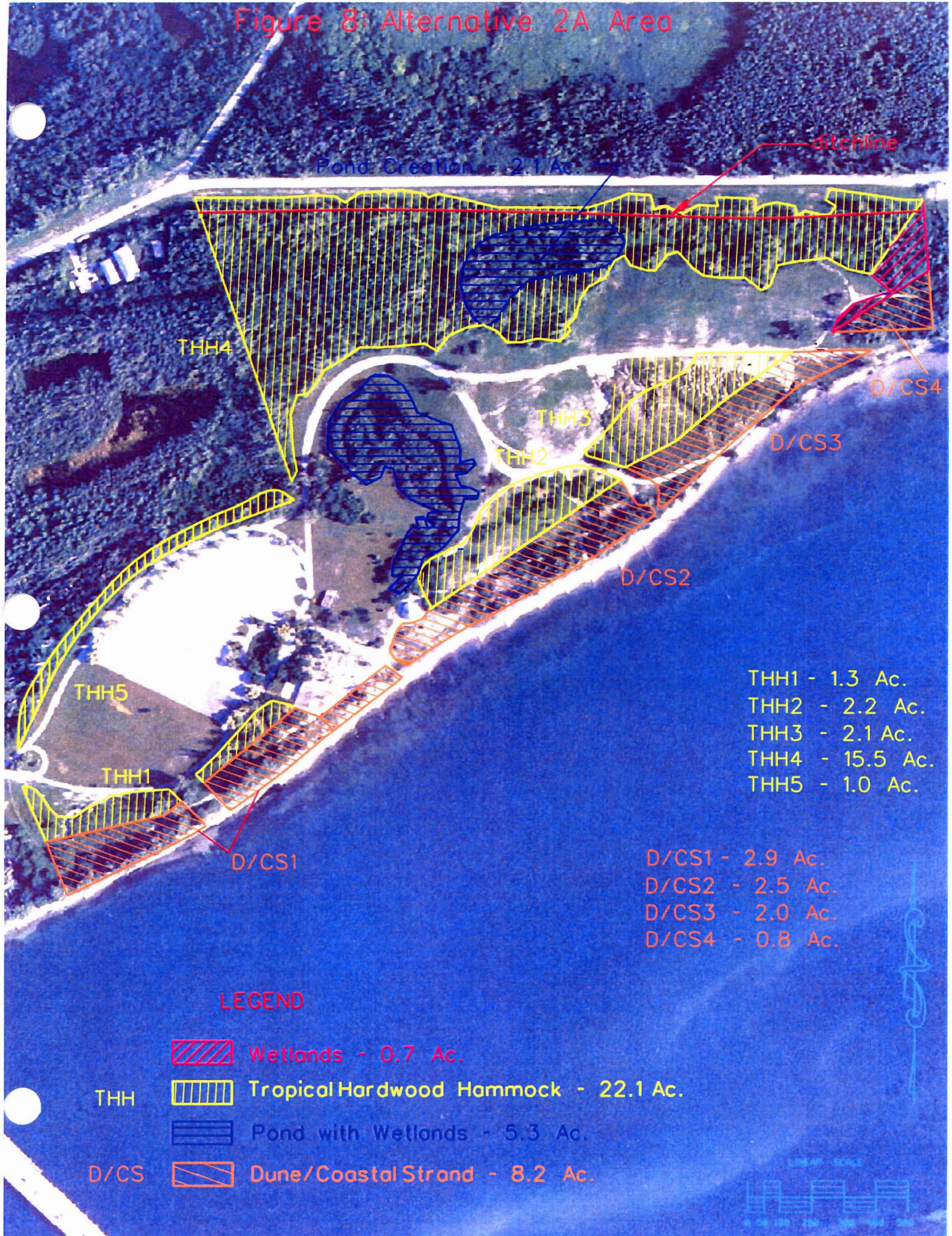
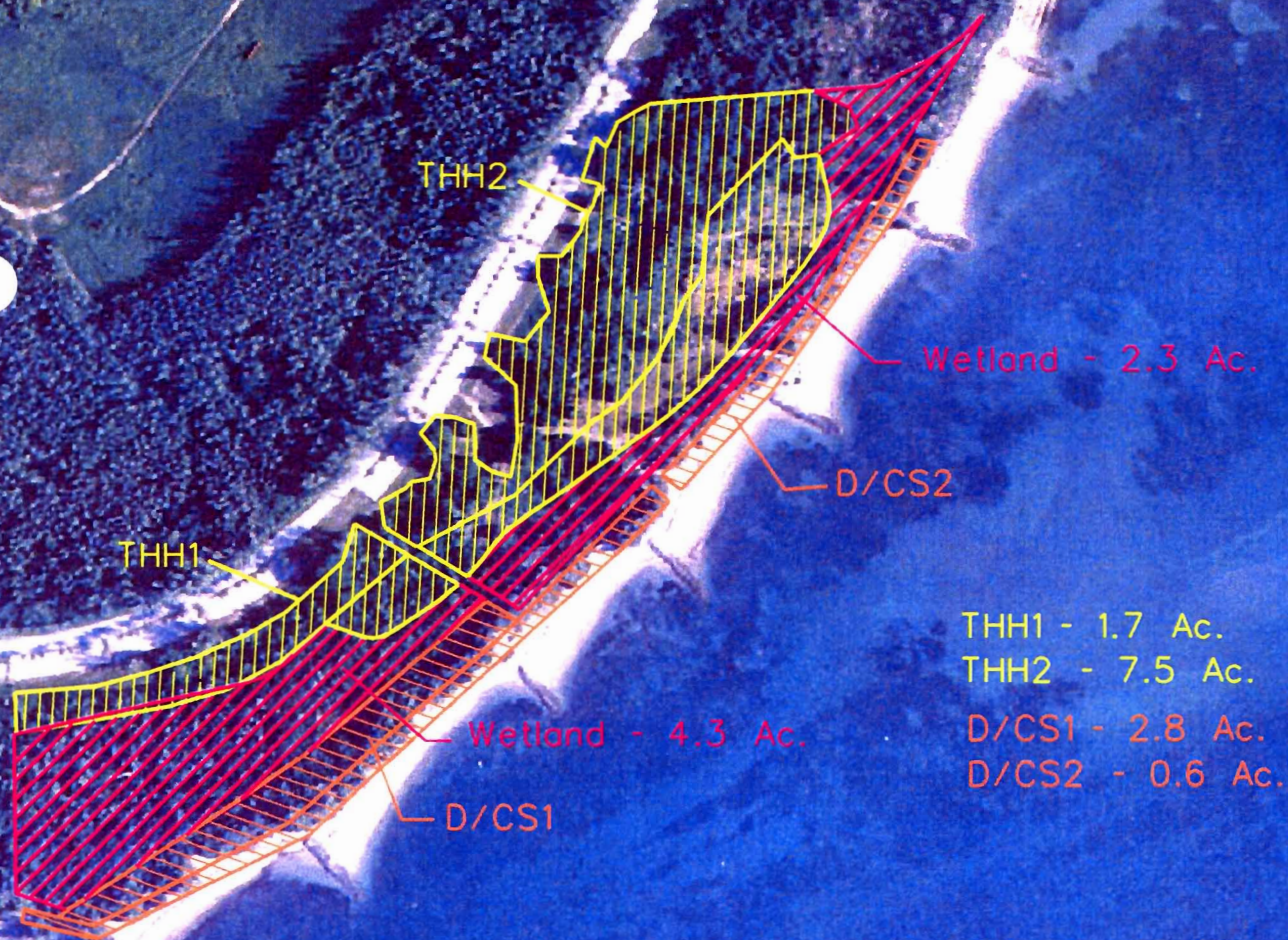




Figure 9: Alternative 3 Area



LEGEND

-  Tropical Hardwood Hammock - 9.2 Ac.
-  Wetlands - 6.6 Ac.
-  Dune/Coastal Strand - 3.4 Ac.



Figure 10: Alternative 4 Area







FIGURE 11  
VIRGINIA KEY  
1135 PROJECT  
RECREATION  
PLAN



## **RATIONAL FOR SELECTING A PLAN**

83. Four accounts are established to facilitate evaluation and display of the effects of alternative plans. These accounts are national economic development (NED), environmental quality (EQ), regional economic development (RED), and other social effects (OSE). These four accounts encompass all significant effects of plan implementation, including economic, socioeconomic, and environmental criteria that must be considered in water resources planning as prescribed by Federal laws.

a. National Economic Development (NED). This account displays changes in the economic value of the national output of goods and services.

b. Environmental Quality (EQ). This account displays non-monetary effects on significant natural and cultural resources.

c. Regional Economic Development (RED). This account registers changes in the distribution of regional economic activity that result from project construction. Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output, and population.

d. Other Social Effect (OSE). This account registers project effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts.

## **COMPARISON AND EVALUATION OF ALTERNATIVES**

84. Comparison of alternative plans of action leads to the identification of the recommended plan. For ecosystem restoration projects, a plan that reasonably maximizes ecosystem restoration benefits compared to costs, consistent with the Federal objective, shall be selected. The selected plan must be shown to be cost-effective and justified to achieve the desired level of output. This plan shall be identified as the National Ecosystem Restoration (NER) plan.

85. Consideration of many factors in plan formulation and evaluation is prescribed in a large number of Federal laws. They include:

- The Water Resources Planning Act of 1965, as amended. This Act and its amendments establish economic and environmental principles and guidelines to be followed in water and related land resources implementation studies.
- The 1969 National Environmental Policy Act (NEPA), Public Law 91-190 (42 USC 4321) requires assessment of alternative plan impacts on the human environment and on significant recreational quality resources (40 CFR 1508.14). NEPA also requires documentation of the planning process, alternative plan comparison and plan selection.
- Section 122 of the 1970 Rivers and Harbors Act (Public Law 91-611, 84 STAT. 1823) requires that for any proposed project, full consideration be

given to possible adverse economic, social, and environmental effects. It also requires that final decisions on the project are made in the best overall public interest, taking into consideration the need for flood control, navigation and associated purposes, and that the associated costs of eliminating or minimizing the adverse effects on the following:

- Air, Water, and Noise Pollution;
  - Destruction or disruption of man-made and natural resources
  - Aesthetic Values;
  - Community cohesion and availability of public facilities and services
  - Adverse employment effects
  - Tax and Property value losses
  - Injurious displacement of people, businesses and farms
  - Disruption of desirable community and regional growth
- Section 904 of the 1986 Water Resources Development Act, Public Law 99-662 (100 STAT. 4185, 33 USC 2281) as amended by Section 315 of the 1990 Water Resources Development Act (Public Law 101-640, 104 STAT. 4641) describes additional requirements that must be addressed in the formulation and evaluation process for Federal water resources projects. These requirements are listed below. The formulation and evaluation process must consider the associated benefits and costs of these items, both quantifiable and un-quantifiable, and must be displayed in the benefits and costs of such projects.
- Enhancing national economic development;
  - Quality of the total environment, including preservation and enhancement of the environment
  - The well being of the people;
  - Prevention of loss of life;
  - Preservation of cultural and historical values
- Section 905 of the 1986 Water Resources Development Act, Public Law 99-662 (100 STAT. 4185, 33 USC 2282) describes requirements for feasibility reports for water resources projects or studies authorized to be undertaken by the Secretary of the Army. The feasibility report will describe with reasonable certainty the economic, environmental and social benefits and detriments of the recommended plan and alternative plans considered by the Secretary. The report shall also demonstrate that the states, other non-Federal interests, and Federal agencies have been consulted in the development of the recommended plan.
- Section 306 of the 1990 Water Resources Development Act (Public Law 101-640, 104 STAT. 4635, 33 USC 2316) mandates that environmental protection is a primary mission of the Corps in the planning, design, construction, operation and maintenance of water resources projects.

- Section 307 of the 1990 Water Resources Development Act (Public Law 101-640, 104 STAT. 4635, 33 USC 2317) establishes, as part of the water resources development program, an interim goal of no overall net loss of the Nation's wetlands, as defined by acreage and function. The Act also prescribes a long-term goal to increase the quality and quantity of the Nation's wetlands, as defined by acreage and function.

86. Finally, planning criteria require that the selected plan be technically and institutionally implementable. The non-Federal sponsor must have the institutional authority, financial capability and overall support to implement the project. The non-Federal sponsor must document that capability in order to recommend the selected plan as a Federal project. The plan must be acceptable to and endorsed by the state, county and / or municipal authorities as a comprehensive solution to the water resources problem addressed by the study.

87. Corps planning guidance specifies four evaluation criteria to be used in screening alternatives: acceptability, completeness, effectiveness and efficiency.

88. **ACCEPTABILITY:** An ecosystem restoration plan should be acceptable to State and Federal resource agencies, local government, and the non-Federal sponsor. There should be evidence of broad-based public support for the plan. Based on preliminary discussions with the USFWS, the National Marine Fisheries Service (NMFS) and FDEP the alternatives detailed above are acceptable to Federal and state resource agencies. Local conservation and non-profit groups, including the Tropical Audubon Society, have also been involved in project planning meetings and/or the planning charrette and have provided input into the planning process.

89. **COMPLETENESS:** An ecosystem restoration plan must provide and account for all necessary investments or other actions needed to ensure the realization of the planned restoration outputs. This may require relating the plan to other public or private plans if those plans are crucial to the outcome of the restoration objective. The alternatives carried forward to the final evaluation phase are all complete plans. Each covers all aspects of restoration necessary for their respective scopes and scales. They would complement previous restoration projects and could be maintained for the long term with those other projects.

90. **EFFICIENCY:** An ecosystem restoration plan must represent a cost-effective means of addressing a restoration problem or opportunity. Planners must show that the plan's restoration outputs cannot be produced more cost effectively by another agency or institution. Because of the engineering expertise, planning, environmental coordination and compliance and construction required by the proposed restoration plan alternatives, the Corps is uniquely positioned to address the defined problems and implement the restoration plan in an efficient manner. Neither the COM nor the County has the resources necessary to undertake the proposed alternatives alone.

91. **EFFECTIVENESS:** An ecosystem restoration plan must make a significant contribution to addressing the specified restoration problems or opportunities. It must restore important ecosystem structure or function to some meaningful degree. All proposed alternatives would restore structure and function of native ecosystems that have been lost to a significant extent and are in need of restoration.

92. Table 1 highlights similarities and differences of the alternative plans outlined above and summarizes their impacts to facilitate plan evaluation and comparison. It also provides information for compliance with NEPA documentation requirements.

Table1. Comparison of Alternatives

<b>Table 1. SUMMARY OF EFFECTS</b>					
<b>Item</b>	<b>No Action</b>	<b>Alternative 2</b>	<b>Alternative 2A</b>	<b>Alternative 3</b>	<b>Alternative 4</b>
<b>A. PLAN DESCRIPTION</b>	Do Nothing/ (Without Project Condition)	Lower Key Restoration	Lower Key Restoration w/ New Pond/Wetland	Middle Key Restoration	Upper Key Restoration
<b>B. IMPACT ASSESSMENT</b>					
<b>1. National Ecosystem Restoration</b>					
<b>a. Beneficial Impacts</b>					
(1) Ecological Structure and Function	None	High	High	High	High
(a) Native Plant Survival	None	High — all exotic species removed and replaced with natives	High — all exotic species removed and replaced with natives	High — all exotic species removed and replaced with natives	High — all exotic species removed and replaced with natives
(b) Native Wildlife Habitat	None	High	High	High	High
(c) Neotropical Migratory Birds	None	High — tropical hardwood forest in large patches particularly important	High — tropical hardwood forest in large patches particularly important, additional wetlands created	High — tropical hardwood forest in large patches particularly important	High — tropical hardwood forest in large patches particularly important
(d) Nutrient Cycling	None	High	High	High	High
(2) Aesthetics	None	High	High	High	High
(3) Habitat Units	None	28.1	27.26	14.87	2.99
(4) Education and Recreation Opportunities	None	High — Many environmental education opportunities easily accessible to minorities	High — Many environmental education opportunities easily accessible to minorities	High — Many environmental education opportunities easily accessible to minorities	High — Many environmental education opportunities easily accessible to minorities
<b>Total Beneficial Impacts</b>	<b>None</b>	<b>High</b>	<b>High</b>	<b>High</b>	<b>High</b>
<b>b. Adverse Impacts</b>					
(1) Ecological Structure and Function	High	None	None	None	None

<b>Table 1 SUMMARY OF EFFECTS</b>					
(a) Native Wildlife	High	None	None	None	None
(b) Native Plants	High	None	None	None	None
(c) Neotropical Migratory Birds	High	None	None	None	None
(d) Nutrient Cycling	Med	None	None	None	None
(2) Aesthetics	Med	None	None	None	None
(3) Habitat Units	High	0	0	0	0
(4) Education and Recreation Opportunities	High	None	None	None	None
<b>Total Adverse Impacts</b>	High	None	None	None	None
<b>Net Ecosystem Restoration Benefits</b>	<b>None</b>	<b>High</b>	<b>High</b>	<b>High</b>	<b>High</b>
<b>2. Environmental Quality</b>					
<b>a. Beneficial Impacts</b>					
(1) Water Circulation	None	None	None	None	None
(2) Manmade Resources *	None	Med — Would provide enhanced education opportunities in park.	Med — Would provide enhanced education opportunities in park.	Med — Would provide enhanced education opportunities in park.	Med — Would provide enhanced education opportunities in park.
(3) Noise Level Changes *	None	None	None	None	None
(4) Public Facilities *	None	Med — Would provide enhanced education opportunities in park.	Med—Would provide enhanced education opportunities in park.	Med—Would provide enhanced education opportunities in park.	Med — Would provide enhanced education opportunities in park.
(5) Security of Life, Health, and Safety *	None	None	None	None	None
(6) Tax Changes *	None	Potential increase in tax base as area develops.	Potential increase in tax base as area develops.	Potential increase tax base as area develops.	Potential increase tax base as area develops.
(7) Aesthetic Values *	None	High — able to support native flora and fauna and limited educational use.	High — able to support native flora and fauna and limited educational use.	High — able to support native flora and fauna and limited educational use.	High — able to support native flora and fauna and limited educational use.
(8) Natural Resources *	None	High	High	High	High
(9) Biological Resources *	None	High—Native biota in 4 habitats; connectivity to large protected habitat blocks	High—Native biota in 4 habitats; connectivity to large protected habitat blocks	Med—Native plants, birds, coastal strand, wetland strand, tropical hammock biota	Med—Native plants, birds, coastal strand, tropical hammock biota
(10) Air Quality*	None	None	None	None	None
(11) Water Quality *	None	None	None	None	None



<b>Table 1 SUMMARY OF EFFECTS</b>					
(12) Public Services *	None	High—greater public park opportunities	High—greater public park opportunities	Med—greater public park opportunities	Low—greater public park opportunities
(13) Cultural and Historical Preservation	None	High	High	High	High
<b>Total Beneficial Impacts to Quality of the Environment **</b>	<b>None</b>	<b>High</b>	<b>High</b>	<b>Med</b>	<b>Low</b>

<b>b. Adverse Impacts</b>					
(1) Water Circulation	None	None	None	None	None
(2) Manmade Resources *	None	None	None	None	None
(3) Noise Level Changes *	None	None	None	None	None
(4) Public Facilities *	Med—Continued degradation of park	None	None	None	None
(5) Security of Life, Health, and Safety *	None	None	None	None	None
(6) Tax Changes *	None	Low—may require increased funds for project construction and maintenance	Low—may require increased funds for project construction and maintenance	Low—may require increased funds for project construction and maintenance	Low—may require increased funds for project construction and maintenance
(7) Aesthetic Values *	High—Continued rampant growth of exotics and degradation of native habitats	Low—Temporary impacts during construction and establishment	Low—Temporary impacts during construction and establishment	Low—Temporary impacts during construction and establishment	Low—Temporary impacts during construction and establishment
(8) Natural Resources *	High—Continued rampant growth of exotics and degradation of native habitats	None	None	None	None
(9) Biological Resources *	High—Continued degradation of native habitats may impact rare, threatened and endangered species	None	None	None	None
(10) Air Quality*	None	None	None	None	None
(11) Water Quality *	None	None	None	None	None

(12) Public Services *	High—Diminished public park opportunities	None	None	None	None
(13) Cultural and Historical Preservation **	Med—Diminished public opportunities at historic park	None	None	None	None

<b>Total Adverse Impacts to Quality of the Environment **</b>	<b>Med-High</b>	<b>None</b>	<b>None</b>	<b>None</b>	<b>None</b>
<b>3. Other Social Effects</b>					
<b>a. Beneficial Impacts</b>					
(1) Community Cohesion *	None	Med--Increased educational opportunity and understanding	Med--Increased educational opportunity and understanding	Med--Increased educational opportunity and understanding	Med--Increased educational opportunity and understanding
(2) Employment*	None	Low--Some local jobs during construction. Job availability in the future as restoration is maintained.	Low--Some local jobs during construction. Job availability in the future as restoration is maintained.	Low--Some local jobs during construction. Job availability in the future as restoration is maintained.	Low--Some local jobs during construction. Job availability in the future as restoration is maintained.
(3) Tax Values *	None	Low--Potential to increase nearby property values	Low--Potential to increase nearby property values	Low--Potential to increase nearby property values	Low--Potential to increase nearby property values
(4) Community Growth *	None--Property restricted to use as public park	None-Low--May attract residents	None-Low--May attract residents	None-Low--May attract residents	None-Low--May attract residents
(5) Property Values *	None	Low--Potential to increase nearby property values	Low--Potential to increase nearby property values	Low--Potential to increase nearby property values	Low--Potential to increase nearby property values
(6) Displacement of Businesses *	None--Property restricted to use as public park	None	None	None	None
<b>b. Adverse Impacts</b>					
(1) Community Cohesion *	Low	None	None	None	None
(2) Employment*	None	None	None	None	None
(3) Tax Values *	Low--Potential for decreased nearby property values	None	None	None	None
(4) Community Growth*	Low--No attraction to residents	None	None	None	None
(5) Property Values *	Low--Potential for decreased nearby property values	None	None	None	None
6) Injurious Displacement of Farms *	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
<b>c. Preservation or loss of life**</b>	No effect.	No effect.	No effect.	No effect.	No effect.
<b>4. National Economic Development</b>					
a. Total Initial Construction Cost	None	\$ 1,173,800	\$ 1,247,700	\$ 539,900	\$ 124,100
b. OMR&R Cost	None	\$ 27,110	\$ 27,110	\$ 15,330	\$ 2,090
c. Average Annual Cost	None	\$ 95,730	\$ 100,255	\$ 46,818	\$ 9,326
d. NED/RED	None	\$1,120,600	\$1,120,600	\$1,120,600	\$1,120,600

Benefits		Average Annual Recreational Benefits	Average Annual Recreational Benefits	Average Annual Recreational Benefits	Average Annual Recreational Benefits
<b>C. PLAN EVALUATION</b>					
<b>1. Fulfillment of Planning Objectives</b>					
a. Remove exotic vegetation from Virginia Key	None	High	High	High	Med
b. Plant native species for different habitat types	None	High	High	Med	Med
c. Improve / increase Pond w/ wetlands habitat	None	Med	High	Med	None
d. Provide education/recreation opportunities	None	High	High	High	High
<b>2. Response to Evaluation Criteria</b>					
a. Acceptability	None	High	High	High	High
b. Completeness	None	High	High	High	High
c. Effectiveness	None	High	High	High	High
d. Efficiency	None	High	Med	High	High
<b>D. IMPLEMENTATION RESPONSIBILITY</b>	Interested county and state governments.	Federal Government, non-Federal sponsor in cooperation with other concerned agencies in the State of Florida.	Federal Government, non-Federal sponsor in cooperation with other concerned agencies in the State of Florida.	Federal Government, non-Federal sponsor in cooperation with other concerned agencies in the State of Florida.	Federal Government, non-Federal sponsor in cooperation with other concerned agencies in the State of Florida.
<b>E. STATE AND OTHER NON-FEDERAL COORDINATION***</b>	None	USF&WS, NMFS, EPA, FF&WCC, FDEP, Florida State Clearinghouse, Florida State Historic Preservation Officer	USF&WS, NMFS, EPA, FF&WCC, FDEP, Florida State Clearinghouse, Florida State Historic Preservation Officer	USF&WS, NMFS, EPA, FF&WCC, FDEP, Florida State Clearinghouse, Florida State Historic Preservation Officer	USF&WS, NMFS, EPA, FF&WCC, FDEP, Florida State Clearinghouse, Florida State Historic Preservation Officer

**Notes:**

- \* - Items specifically required by Section 122 of Public Law 91-611 (84 STAT. 1823)
- \*\* - Items specifically required by Section 904 of the 1986 Water Resources Development Act.
- \*\*\* - Items specifically required by Section 905 of the 1986 Water Resources Development Act.

**93. ENVIRONMENTAL CONSIDERATIONS:** In order to compare the beneficial effects of all alternatives developed, we calculated environmental outputs for each alternative. Details of calculation of output units and analysis of the results can be found in the Environmental Assessment. In addition, we provided a summary of the effects of each project component on all significant environmental resources. Restoration of tropical hardwood hammock provided the greatest increase in habitat units compared to current and without-project conditions. Restoration of coastal strand, though contributing much less than tropical hardwood hammock, provided the next greatest number of habitat units. Because acreages of mangroves and freshwater pond/marsh are low and do not change significantly from alternative to alternative, their contributions to total habitat units are fairly low, although the habitats themselves are significant.

## **PARTNERSHIP CONTEXT**

94. The proposed restoration project represents a unique partnership opportunity with which we can both restore lost ecosystem structure and function in Biscayne Bay and provide much needed educational and recreational opportunities for minority members of the Miami-Dade community. Environmental education experiences are rarely designed specifically with minority participants in mind. Low-income and minority students and adults in Miami-Dade County often do not have the opportunity to access islands in the Bay and may therefore have little direct experience of its natural ecosystems. Virginia Key is easily accessible by road, so its opportunities are open to a much larger percentage of the population than those islands accessible only by boat.

95. While the COM is the local sponsor working with the Corps to plan and implement the proposed project, they are also working in partnership with other agencies and entities to fully realize all potential benefits of project implementation. The Virginia Key Civil Rights Task Force, for example, was instituted in 1999 to oversee and develop plans for the restoration of Virginia Key Park. In addition, DERM is working closely with both the City and the Corps to provide their expert knowledge of the Park's natural and biological resources and Biscayne Bay ecology.

96. Through these partnerships, the proposed restoration project has the potential to educate thousands of Miami-Dade residents each year about the structure and function of Biscayne Bay's natural resources, the contributions of minorities in their protection, and the importance of ecosystem restoration and on-going protection to future generations.

## **COST EFFECTIVENESS AND INCREMENTAL COST ANALYSIS**

97. Engineer Regulation 1105-2-100 requires cost effectiveness and incremental cost analysis of alternatives to support recommendations for ecosystem restoration. Cost effectiveness analysis begins with a comparison of the costs and outputs of alternative plans to identify the least cost plan for every possible level of output. The resulting least cost alternative plans are then compared to identify those that will produce greater levels of output at the same cost, or at a lesser cost, as other alternative plans. Alternatives identified through this comparison are the cost effective alternatives. Next, cost effective alternatives are compared to identify the most economically efficient alternatives, that is, the "best buy" alternatives that will progressively produce the "biggest bang for the buck." Finally, the additional costs for additional amounts of output (incremental cost) produced by the best buy alternative plans are calculated.

98. Costs were characterized in dollars and represent the difference between the without-project condition and conditions with a plan or alternative. The benefits of each of the alternatives were characterized in terms of habitat units that serve as a quantitative expression of environmental output. For each alternative, the expected number of habitat units to occur in the future without the project was subtracted from

the number of habitat units expected to occur with the restoration project. That difference in habitat units represents the benefits due to restoration.

99. IWR-PLAN Decision Support Software, version 3.3 was used for cost effectiveness and incremental cost analysis. Cost effectiveness analysis indicates that all four alternatives are cost effective. There are no other plans that produce the same or greater levels of ecosystem benefits (or outputs) at lower costs. Table 2 displays Best Buy alternatives. See Appendix C, Economic Analysis for the complete analysis.

Table 2. Incremental Cost Of The Best Buy Alternatives

Alternative	Habitat Units (HU)	Total Annual Cost (\$)	Average Cost (\$) Per Habitat Unit	Inc. Cost \$	Inc. Output	Inc. cost Per Output
3 and 4	17.85	54,712.60	3,064.27	54,712.61	17.855	3,064.27
2, 3 and 4	45.95	149,772.19	3,259.11	95,059.59	28.100	3,382.90

100. Alternative 2, 3 and 4 (Lower, Middle, and Upper Key Restoration) was chosen as the recommended plan (Figure-12). First and foremost, it clearly meets the National Ecosystem Restoration project goals and objectives, and is the most cost effective best buy. It will provide a significant degree of restoration of tropical hardwood hammock, one of South Florida's most threatened and significant ecosystems. Importantly, it will also provide a large ecosystem patch size, which is essential for many species that inhabit the interior portions of ecosystems, far from edge effects and the outside influences of urban development. It will also provide better connectivity between habitats than selection of any individual alternative alone. Further, the restoration of wetland habitat will lead to more leaf and detritus production, which serves as the base of the food chain. Greater amounts of wetland habitat provide potential for greater health and larger populations of many commercially important fish species in Biscayne Bay. Finally, the recommended plan removes exotic species from the entire site, resulting in much higher probability that removal will be permanent. Removal of exotics will aid establishment of desirable native plant species.



FIGURE 12  
VIRGINIA KEY  
1135 PROJECT  
RECOMMENDED  
PLAN





100. Alternative 3 and 4 restores a contiguous area of important habitat, however, it fails to realize a significant portion of the possible restoration area for tropical hardwood hammock, arguably the most significant native ecosystem in need of restoration. The additional cost of Alternative 2, 3, and 4 compared to Alternative 3 and 4 is considered acceptable since it has a higher output of Habitat Units (HU) with a small increase in incremental cost per output as shown in Table 2. The recommended plan restores a much greater and more diverse amount of habitat, benefiting ecosystem function as well as educational and recreational components of the area.

## **V. RECOMMENDED PLAN**

101. Projects for restoring ecological resources may be recommended based on the monetary and non-monetary benefits anticipated from the measures recommended. The recommended plan should be the justified alternative and scale having the maximum excess of monetary and non-monetary beneficial effects over monetary and non-monetary costs. This plan will be called the National Ecosystem Restoration plan (NER plan).

102. In some instances, a non-Federal sponsor may not be able to afford or otherwise support the NER Plan. Plans requested by the non-Federal sponsor that deviate from the NER plan shall be identified as the Locally Preferred Plan (LPP). Projects may deviate from the NER Plan if requested by the non-Federal sponsor and approved by the Assistant Secretary of the Army for Civil Works [ASA(CW)]. When the LPP is clearly of less scope and cost and meets the Administration's policies for high-priority outputs, an exception for deviation is usually granted by ASA(CW). The City of Miami, the local sponsor for this project, elected to support the implementation of the Corps' recommended plan. The COM is dedicated to achievement of the project's objectives.

## **PLAN COMPONENTS**

103. The study team, in consultation with the local sponsor and other knowledgeable local agencies, selected Alternative 2, 3, & 4 (Lower, Middle, and Upper Key restoration) as the preferred restoration plan. According to this recommended plan the Corps and COM would restore approximately 3.2 acres of pond with wetlands, 7.3 acres of wetlands, 13.7 acres of dune/coastal strand and 34.9 acres of tropical hardwood hammock at Virginia Key. Ancillary educational and recreational features designed to provide environmental education opportunities to all Virginia Key Park's visitors would also be developed. They include interpretive walking trails appropriate for children and adults and educational signs identifying restored habitats and species. In addition, signs summarizing the contributions of African Americans and other minorities to the environmental movement in the United States are proposed to complement the historical focus of the park.

## **PLAN DESIGN AND CONSTRUCTION**

105. The evaluations performed to develop the proposed project plan were based on engineering design regulations and empirically established criteria. The following considerations were deemed crucial to successful plan design and construction for this project.

### **Wetland Habitat Elevation**

106. Elevation is critical to the survival of plants in restored and created wetlands. For example, for the wetland area in Alternative 3 we assumed that elevation must be appropriate where mangroves are already growing. In this area we propose only to remove exotics and replant mangroves at existing elevation. No excavation or grading will be required.

### **Beaches, Seagrasses and Construction**

107. Seagrasses surround the island in large beds and patches. Seagrass communities have been identified as essential fish habitat by the National Marine Fisheries Service, and as such, are afforded special protection. In addition, ecosystem restoration projects carried out by the Corps shall not have natural resource impacts requiring mitigation. For these reasons, the contractor shall use only construction equipment and techniques that will not damage or adversely affect seagrasses along the beach and coastal strand. Construction equipment, materials and vehicles will be allowed on the beach only in cases where no other access to coastal strand restoration areas is possible, will follow agreed upon methods for avoiding impacts to nesting or hatching sea turtles or wintering or nesting shorebirds, and will not be allowed below the mean high water line.

### **Construction Methods**

108. The contractor will use standard equipment and practices to remove vegetation, excavate designated sites for freshwater pond and marsh creation, remove excavated material and dispose of that material. Cleared vegetation will be chipped and used as mulch on-site for planting of native vegetation, wherever possible and cost effective.

### **Excavation and Disposal**

109. All material excavated through the restoration project will be dewatered (if necessary) and deposited in the upland disposal area at the northern end of Virginia Key. No material will be disposed of in the water, nor will it cover or impact seagrass beds adjacent to the island.

### **Exotic Vegetation Removal Methods**

110. Because of the ecological sensitivity of mangrove wetlands and the surrounding seagrass community, and because of the presence of native vegetation on portions of the island, contractors will employ a variety of methods to remove exotic vegetation. In highly degraded sites where relatively large areas will be cleared of exotic vegetation, contractors may clear exotic vegetation with heavy



machinery. In more sensitive areas with large numbers of native specimens to be retained, contractors shall selectively clear individual trees, shrubs and herbaceous plants by cutting and / or pulling them from the area with minimal disturbance to the soil. In areas where the on-site biologist determines the soil should not be disturbed at all, contractors may cut individual plants above ground, removing stems, leaves and branches, leaving in place a stump which may be treated with approved herbicides. Herbicides to be employed shall be coordinated with resource agencies to insure that their application will not adversely affect surrounding upland, wetland or marine plant or animal species.

#### **Geotechnical Data**

111. The geotechnical branch of the Jacksonville District Corps investigated and analyzed subsurface data collected in October 2001 in preparation for this restoration study. The information is required in order to assess the suitability of local sediments for construction and disposal in the proposed upland spoil disposal site. Most construction and disposal is related to the proposed placement of the freshwater pond in Alternative 2A which is not part of the recommended plan. Other grading for landscape purposes will mostly be small-scale filling and will not require disposal. Therefore geotechnical data, though available, is not included in the report.

#### **Operations and Maintenance**

112. Future operation and maintenance responsibilities for the proposed project include monitoring the establishment and survival of planted vegetation bi-monthly for three years following construction; exotic plant removal on a quarterly basis for three years; quarterly replacement of plants that die; and quarterly maintenance of trails and educational features. Monitoring of an ecosystem restoration project such as this is critical to its success. Anticipated ecosystem structural and functional benefits cannot be realized without the establishment and survival of planted species and the avoidance of re-invasion by exotic species. It is also imperative in design of future Corps ecosystem restoration projects to understand how past projects have performed.

113. Indicators of success include the presence of a diversity of native plants and animals suitable to each ecosystem type, the ability of the area to sustain larger numbers of indicator species or more biologically desirable species, and the ability of the restored area to continue to function and produce desired ecosystem outputs over the long term with a minimum of continuing human intervention.

#### **SUMMARY OF PLAN IMPACTS**

114. A detailed summary of direct and indirect impacts of the proposed project on environmental resources can be found in Table 1 of the Environmental Assessment included with this report (green pages). Following are brief explanations of potential impacts to factors of particular importance for this project.

### **Navigation**

115. The proposed project would have no impact on navigation. All restoration activities proposed for Virginia Key are located in uplands or coastal areas that would not require water access. The contractor will use public roads to transport equipment to and from the island.

### **Water Quality**

116. The proposed project would comply with all Federal and non-Federal water quality requirements. While a water quality permit would not be required, appropriate measures for the control of turbidity and maintenance of appropriate water quality standards during project construction would be followed.

### **Fish and Wildlife**

117. The proposed project will provide more native freshwater and coastal habitats with greater structural complexity and increased functional ability. Impacts to native aquatic, terrestrial and avian fauna are expected to be beneficial. The increase in wetlands will provide nursery areas for juveniles of many Bay fish species, as well as habitat and food for adult fish, invertebrates, wading birds, migratory songbirds and terrestrial wildlife. Restoration of tropical maritime (coastal) hammock and transitional coastal strand habitats will provide additional foraging, nesting, and/or roosting habitat for wading and migratory birds. Many neotropical migratory songbirds travel from northern breeding habitat to Central and South American wintering habitat in a broad path called the Atlantic Coast flyway. Along the way many rare migrants such as the pine siskin (*Carduelis pinus*), Tennessee warbler (*Vermivora peregrina*), Swainson's thrush (*Catharus ustulatus*) and indigo bunting (*Passerina cyanea*) use coastal hammocks as vital resting and refueling stops along the way. Creation of the freshwater pond and marsh will provide potential habitat for the endangered American Crocodile, as well as fish, invertebrates, amphibians and wading birds.

### **Threatened and Endangered Species**

118. A biological assessment of the potential impacts of the proposed project to Federally listed threatened and endangered species has been prepared in accordance with Section 7 of the Endangered Species Act and forwarded to the USFWS for consultation. Listed species that may be present in the vicinity of Virginia Key include: West Indian Manatee (*Trichechus manatus*), Bald Eagle (*Haliaeetus leucocephalus*), Wood Stork (*Mycteria americana*), American Crocodile (*Crocodylus acutus*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), and Loggerhead Sea Turtle (*Caretta caretta*). For more detailed information about threatened and endangered species and analysis of potential project impacts to them, see the Environmental Assessment included with this ecosystem restoration report.

### **Cultural Resources**

119. In compliance with the National Historic Preservation Act, as amended, archaeologists contracted by the Corps conducted a cultural resource investigation

for the areas on Virginia Key proposed for restoration. No cultural resources were found. A copy of the report has been sent to the State Historic Preservation Officer for approval.

### **Environmental Education and Recreation**

120. The proposed ancillary education and recreation component will build upon the ecosystem restoration project without negatively impacting that restoration. It is designed to provide direct experience of Biscayne Bay ecosystems to underserved local populations such as low-income and minority populations. While minimal opportunities exist under the no-project conditions, the proposed features would significantly increase the number and types of educational and recreational programs that could be offered. The Biscayne Bay Management Committee documented a need for such educational and recreational opportunities in the Miami-Dade County area in 1986 (BBMC, 1986). Still today, no other such facilities exist in the area whose focus is targeted toward the above-mentioned underserved populations.

### **Other Social Effects**

121. The following impacts may result from project construction:

- Noise. Implementation of the recommended plan would have no significant noise impact. Construction noise would be temporary in nature and would be restricted to the area immediately surrounding the island on which work is concentrated.
- Displacement of people, businesses and farms. Implementation of the recommended plan would displace no legal residents, businesses or farms.
- Leisure Opportunities. Implementation of the recommended plan would enhance leisure opportunities for underserved segments of the local population by providing access to Bay resources and education about them.
- Aesthetic Values. Once native vegetation is established the islands would be more visually pleasing to visitors than it is now.

### **National/Regional Economic Development**

122. The National Economic Development (NED) account displays the changes in the economic value of the national output of goods and services. All alternatives will provide considerable recreational benefits that are described in more detail in the Recreation section below and in the Recreation Resource Appendix E.

123. The Regional Economic Development account registers changes in the distribution of regional economic activity that result from each alternative plan. The magnitude of the economic impacts will be minimal for all alternatives considering the project expenditures and the size of the Miami-Dade County economy.

## **PLAN COSTS**

### **Real Estate Requirements**

124. Please see Appendix D for Real Estate information.

### **Costs of Alternatives**

125. Construction costs include the engineering and design necessary for the project, preparation of contract plans and specifications, supervision and contract administration, construction monitoring, and disposal areas. Costs for environmental mitigation will not be required since ecosystem restoration projects such as this avoid resource impacts and the need for mitigation. Costs for the identification and removal of any hazardous and toxic wastes are normally included. See Economics Appendix C for additional details. Other costs include non-construction costs such as economic investment costs, interest and amortization costs, and operation and maintenance costs.

126. Table 3 outlines estimated costs for each alternative. Interest was computed for construction costs from the middle of the month in which the expenditures were incurred until the first of the month following the estimated construction periods for each alternative as defined in Table 3. The cost of a project is the investment incurred up to the beginning of the period of analysis. The investment cost at that time is the sum of construction and PED cost plus interest during construction. For each of the alternatives total implementation costs were calculated and average annual equivalent costs (based on a 50-year project life, using a 5.375 percent discount rate, and FY 2004 price levels) were derived. The current FY 2005 price levels were used for the recommended plan. Table 3 summarizes the average annual cost for each of the alternatives that were used in the cost effectiveness and incremental cost analyses.

Table 3. Summary of Costs by Alternative (2004 dollars)

Cost Categories	Without Recreation component										Alternative 2 + 3 + 4	Alternative 2A + 3 + 4	Alternative 3 + 4
	Alternative 2	Alternative 2A	Alternative 3	Alternative 4	Alternative 2+3	Alternative 2A + 3	Alternative 45.96	Alternative 42.13	Alternative 45.12	Alternative 17.86			
Habitat Units (HU)	28.10	27.26	14.87	2.99	42.97	42.13	45.96	45.12	17.86				
Initial Construction Cost	1,146,300	1,220,200	512,400	96,600	1,658,600	1,732,500	1,755,000	1,829,000	608,900				
Real Estate Cost	27,500	27,500	27,500	27,500	27,500	27,500	27,500	27,500	27,500				
Total Initial Cost	1,173,800	1,247,700	539,900	124,100	1,686,100	1,760,000	1,782,500	1,856,500	636,400				
Interest during Const.	9,700	13,846	3,174	697	22,754	27,978	32,627	38,460	6,791				
Total Investment	1,183,500	1,261,546	543,074	124,797	1,708,854	1,787,978	1,815,127	1,894,960	643,191				
Interest & Amortization	68,620	73,145	31,488	7,236	99,080	103,668	105,242	109,871	37,293				
OMRR&R Total	27,110	27,110	15,330	2,090	42,440	42,440	44,530	44,530	17,420				
Average Annual	95,730	100,255	46,818	9,326	141,520	146,108	149,772	154,401	54,713				
Construction Time Months	3	4	2	1.5	5	6	6.5	7.5	3.5				

## **PLAN BENEFITS**

### **Ecosystem Benefits**

127. Restoration of ecosystems with native species will provide not only greater ecological function, but also more protection to lands and structures from storm winds and waves than an ecosystem dominated by Australian pines. Restoration of native ecosystems on Virginia Key will provide ecological functions to the Bay area that were lost to development on the nearby mainland shoreline, where restoration is no longer an option. Restoration of the habitats recommended will also encourage the growth of populations of several rare, threatened or endangered species, such as sea turtles, American crocodiles, several plant species and neotropical migratory songbirds.

### **Significance of Ecosystem Outputs**

128. All of the native habitats to be restored are considered significant. Significance of resources, for study planning purposes, is based on public, institutional or technical recognition. Tropical hardwood hammocks are technically recognized for their high species diversity and the significant amount of such habitat lost to development. Dune/coastal strand and wetlands are technically recognized as habitats for rare, threatened or endangered species. Wetlands are recognized for their high primary productivity and essential role as the base of the detrital food web in coastal areas. Freshwater wetlands in general are technically recognized for their relatively high diversity of species, their ability to hold water during droughts, to provide an important source of food and water, and to mitigate the effects of some pollutants. All of these habitats have been institutionally recognized by a variety of regulatory and management programs, as well as restoration efforts. They are beginning to be recognized by the local public as significant resources in need of protection, as evidenced by local outcry over a past City plan to allow private development of these habitats at Virginia Key. The recommended plan would provide the greatest amount of ecosystem outputs because: 1) the area to be restored is large, resulting in greater patch size and less edge effect for faunal species and greater connectivity between habitats. 2) it removes virtually all exotic species, resulting in much higher probability that removal will be permanent. 3) removal of all exotics will aid establishment of desirable native plant species.

### **Socioeconomic Benefits**

129. Restoring a large area of public lands invaded by exotic species to a functioning native ecosystem with ancillary recreation resources would contribute to the well being of the community around it. This ecosystem restoration project would provide considerable environmental education opportunities. It would employ skilled and unskilled local labor, important in an area with a diversity of skills in the labor force. No socio-economically disadvantaged segment of the public would be adversely affected by the proposed project. Minorities would benefit by the designation of the park as a civil rights memorial and historical park, of which the restoration is one part. The proposed project would be in full compliance with the spirit and intent of Executive Order 12898 regarding environmental justice. In



addition, because Virginia Key is accessible by road, the restoration site would provide environmental education opportunities to local schools and the metropolitan public that are easily accessible to all. This "living outdoor classroom" would provide a unique experience for teachers and students to learn first hand about native plants and animals and coastal ecosystem function.

### **Recreation**

130. The ecosystem restoration project would significantly increase the availability of nature oriented recreational experiences in the area. Opportunities to experience tropical hardwood hammock, dune/coastal strand, wetlands and pond with wetlands habitats near an intensively and extensively developed metropolitan area are scarce. The ecosystem restoration project will enhance the quality of outdoor recreation experiences such as bird watching and nature study. With minimal and sustainable features, such as crushed shell trails, resting benches and interpretative signs, the quality of the experience would increase further. Walking, bike riding, jogging, and ocean beach use would all be enhanced with the construction of the recreational component.

131. Recreational use without the project is estimated to be 178,383 Annual User Days. Recreational use with the project is estimated to be 193,200 Annual User Days. Because of the unique, quality experience provided by the project the Unit Day Value would increase from \$4.23 to \$5.80. The Unit Day Value would still increase without the recreational features, because of the benefits from the ecosystem restoration, but not as much. The Annual Activity Value, a measure of the annual benefit derived from the project, is conservatively estimated to be \$1,120,600. The Annual Activity Value of the site without the project is estimated to be \$754,600. The difference of these two values is \$366,000, which is the net annual recreation benefit due to the project. These estimates do not include visitation by tourists or visitors outside the Miami-Dade County area. More detailed information is presented in the Recreation Resource Appendix E.

### **Aesthetics**

132. At one time Virginia Key was considered to be a picturesque barrier island. Development, neglect and the invasion of exotic plant species, however, have caused significant degradation of the highly regarded aesthetic qualities of the island.

133. With restoration, the appearance of the project area will change from weedy, exotic-dominated vegetation to a more uniform planting layout initially. Once the planted vegetation became established, it will provide native seed sources to assist in the restoration infill of the planted habitats. When mature, the restoration project will appear more natural and provide better aesthetic quality. Expected increases in native wading and songbird populations will contribute to the aesthetics of the area.

## PLAN EVALUATION

### Assumptions

134. In developing and evaluating alternatives and choosing the recommended plan, the study team made the following assumptions:

- All construction and restoration work can be completed without impacts to seagrasses.
- Reestablishment of native vegetation in ecosystems to be restored will lead to the natural reestablishment of native fauna.
- Costs of labor and materials will remain stable over project life.
- City will be able to maintain restoration project over its life.
- Public support for protection of park resources will continue to be strong.

### Risks and Uncertainties

135. All ecosystem restoration projects entail some amount of risk and uncertainty. Some risk or uncertainty exists regarding benefits to be realized by project implementation. Others apply to project costs. While risk and uncertainty can never be completely eliminated, proposed projects can be planned and implemented in a manner to reduce risk and uncertainty to the lowest practical levels. Table 4 outlines the type and degree of all risks and uncertainties identified and analyzed by the planning team. Upon completion of this evaluation, the team concluded that none are significant enough to prevent realization of proposed project benefits.

Table 4. Risks and Uncertainties

TYPE AND DEGREE OF RISK/UNCERTAINTY	TO BENEFITS	TO COSTS
<b><u>RISKS</u></b>		
Hurricane during establishment of plants		
high		
med		
low	x	x
Damage to restoration by use of education/recreation features		
high		
med		
low	x	
<b><u>UNCERTAINTIES</u></b>		
Survival of plants		
high		
med		
low	x	x
Restoration of all ecological functions		
high		
med	x	
low		
Re-invasion of exotics		
high		

TYPE AND DEGREE OF RISK/UNCERTAINTY	TO BENEFITS	TO COSTS
	med	
	low	x
Ability of species of concern to reach restored area		
	high	
	med	
	low	x
Ability of City to maintain indefinitely		
	high	
	med	x
	low	
Public Support for Restoration		
	high	
	med	x
	low	x
Availability of Appropriate Plant Species		
	high	
	med	
	low	x
Increase in Labor/Contracting Costs		
	high	
	med	
	low	x
Overall Degree of Risk/Uncertainty to Benefits		
	high	
	med	
	low	x
Overall Degree of Risk/Uncertainty to Costs		
	high	
	med	
	low	x

### **Trade-Off Analysis**

136. Most decisions, including those about which restoration alternative, if any, should be recommended and implemented, require trade-offs among competing, if not conflicting objectives. While such decisions are inherently political, subjective and often implicit, one can improve the quality of decisions made by making the decision-making process more structured and explicit. The planning team identified major project attributes about which trade-offs were being made during the plan formulation process and examined the rationale for the choices made. Below is a list of attributes considered and a brief discussion of each trade-off decision.

137. Dollars/Time. *Given a limited amount of dollars/time to spend on restoration, is the recommended plan the best use of those limited resources, or would other uses or alternatives be more cost effective?* Risks and uncertainties at the proposed restoration site are fairly low, costs are fairly low and time to complete restoration work is fairly short. Outputs, both in terms of ecosystem structure/function, and public education/recreation opportunities, are relatively high. The recommended plan was identified as a "best buy" plan in incremental analysis.

138. Land Uses: *Implementation of the recommended plan will choose certain land uses and preclude others. Are the Federal Government and local sponsor aware of this trade-off and comfortable with the decision made?* Restoration of the selected sites at Virginia Key Park precludes uses such as commercial, residential or industrial development, infrastructure development, or intensive recreation. Because the areas to be restored are already in a public park that is restricted by deed to such use, and because there is broad public support for protection of the park's natural environment, the study team believes this is the best use of the selected sites.

139. Restoration Sites. *Given limited Federal dollars for restoration, is this the best site to restore, or would another be better?* Virginia Key Park is an ideal site for restoration in southeast Florida. It is an undeveloped site, already in public ownership that is limited to use as a public park. Very few sites with such high restoration potential remain undeveloped, much less have limited use and public ownership. In addition, restoration of the area impacted by the original Corps project is not possible. Restoration of the recommended site would still provide much of the same ecological structure and function to the portion of Biscayne Bay affected by the original ecosystem loss.

140. Alternatives. *Does the recommended alternative best meet project objectives, or would another be just as good or better?* The recommended alternative best meets project goals and objectives. It will be effective in restoring ecological structure and function. It will create large patch sizes of restored habitats and will create connectivity between habitats.

141. Habitats. *Are the chosen habitats the best habitats to restore, or would others be better?* Disturbed and degraded habitats such as those currently present in Virginia Key Park are common in low-density development areas throughout southeast Florida. The habitats to be restored are much less common. At the same time they support a greater diversity of native species and greater numbers of rare, threatened and endangered species. Finally, they are habitats native to the proposed restoration site and should thrive with a minimum of on-going maintenance required.

142. Species: *Restoration of the recommended habitats will favor certain species of plants and animals over others. Are the local sponsor and Federal government aware of this, and are the results acceptable?* The recommended plan will restore

habitats that support a large variety of both State and Federally threatened and endangered species. Species currently present include large numbers of plants and animals that are either undesirable (exotic, invasive plants) or common in developed, disturbed or suburban areas (raccoons, common crows, brown anoles, cattle egrets, gray fox). Restoration of habitats chosen would increase the numbers of species and numbers of individuals within species that are rare or limited to larger blocks of high quality native habitat.

143. Awareness and discussion of trade-offs and eventual consensus on choices made helps to ensure that all decisions are transparent and acceptable to project proponents, decision-makers and stakeholders.

### **Conclusion**

144. Assumptions made by the team are reasonable. While risks and uncertainties can never be completely eliminated, those associated with implementation of the recommended plan are fairly low or discountable. Trade-offs would be required to implement the project, but they have been clearly outlined and project sponsors are comfortable with the decision to recommend the proposed alternative.

## **VI. PLAN IMPLEMENTATION**

### **INSTITUTIONAL REQUIREMENTS**

#### **Project Cooperation Agreement (PCA)**

145. Section 101(e) of the 1986 Water Resources Development Act requires that before initiation of construction of a project, the Secretary of the Army and the non-Federal sponsor shall enter into a cooperative agreement according to the provisions of Section 221 of the 1970 Flood Control Act. The non-Federal sponsor must agree to:

- a. Provide the Government all land easements, and rights-of way, and to provide dredged material disposal areas, and perform the necessary relocations required for construction, operation, and maintenance of the project;
- b. Hold and save the United States free from damages due to the construction or operation and maintenance of the project, except for damages due to the negligence of the United States or its contractors, and;
- c. Provide to the Federal Government the non-Federal share of all other costs of construction of the project.

146. Section 912(b)(1) gives the Secretary the authority to require compliance with any conditions pertaining to cooperation by non-Federal sponsors in implementation of water resources projects. These "items of cooperation" are listed in the Recommendations section of this report.



147. No Federal commitments relating to a construction schedule or specific provisions of the Project Cooperation Agreement (PCA) can be made to the non-Federal sponsor on any aspect of this project or separable element until:

- a. The ERR has been approved by higher authority;
- b. The project is budgeted as a new construction start, or construction funds are added by Congress; and
- c. The draft PCA has been reviewed and approved by the Assistant Secretary of the Army for Civil Works.

148. The description of Federal and non-Federal responsibilities will be legally defined in the project cooperation agreement. A model PCA and possible deviations based on the recommended plan must be fully discussed with the non-Federal sponsor prior to the alternatives formulation briefing. This meeting will include an agenda item to ensure that discussions with the non-Federal sponsor have taken place. The purpose is to ensure that the non-Federal sponsor will have a clear understanding of the agreement that they will be expected to sign prior to the start of construction. The Recommendations section of this report describes the items of local cooperation that the non-Federal sponsor will be required to furnish.

149. The PCA will not be executed, nor will construction be initiated on this project until the National Environmental Policy Act, the Clean Water Act, the Coastal Zone Management Act, the Endangered Species Act, the Fish and Wildlife Coordination Act and the National Historic Preservation Act planning phase requirements are met. These requirements will be met for the Virginia Key ecosystem restoration project once the draft environmental assessment has been coordinated, responses to comments prepared, and a final environmental assessment and Finding of No Significant Impact (FONSI) signed.

150. PCA negotiations with the non-Federal project sponsor may be conducted, and the draft PCA package submitted to higher authority for review and approval once the ecosystem restoration report is approved and the project has received commitment of construction funding. The Chief of Engineers will not allocate Federal construction funds for the project until the Government approves the non-Federal sponsor's financing plan and the PCA is executed.

### **Financial Analysis**

151. A financial analysis is required for any plan being considered by the Government for implementation that involves non-Federal cost sharing. The ultimate purpose of the financial analysis is to ensure that the non-Federal sponsor understands the financial commitment involved and has reasonable plans for meeting that commitment. The financial analysis shall include the non-Federal sponsor's statement of financial capability, financing plan, and an assessment of the

sponsor's financial capability. These plans and analyses are part of the draft PCA package submitted to higher authority for review and approval once the ecosystem restoration report is approved and the project is budgeted for construction.

## **DIVISION OF PLAN RESPONSIBILITIES**

### **Cost Allocation**

152. Section 1135 of the 1986 Water Resources Development Act specifies that the cost of ecosystem restoration projects be shared 75 percent Federal and 25 percent non-Federal sponsor. Initially, the Federal Government will fund the feasibility phase ecosystem restoration studies, plans and specifications. If the project proposal is approved for implementation, feasibility study costs will be included with other project construction costs to determine the cost to be shared 75 percent Federal and 25 percent non-Federal.

### **Cost Apportionment**

153. Final cost apportionment will be based on current Federal law and policy at the time of construction. The total first cost of construction, plus any necessary monitoring costs, is the amount used for cost apportionment. The cost of construction for cost apportionment is determined as follows:

Total First Cost of Construction	\$2,193,500
Plus Study Costs \$390,000	\$2,583,500
Less Sponsor's Real Estate Credit (\$12,500)	<u>\$2,571,000</u>
Total Construction/Study Cost-Shared Amount:	\$2,571,000

154. If recreation components are included in an ecosystem restoration project under the authority of Section 1135 of WRDA 1986, those costs must not total more than 10 percent of project cost and must be cost-shared 50 percent Federal and 50 percent non-Federal. Recreation component costs for this project are \$126,500. The sponsor's final cost-shared amount is:

Sponsor's Construction/Study Cost-Shared Amount	
w/o Recreation components (@ 25%):	\$ 611,125
Plus Recreation Cost-Shared Amount (@50%):	<u>+ \$ 63,250</u>
Total Sponsor Cost-Shared Amount:	\$ 674,375

USACE's Construction/Study Cost-Shared Amount	
w/o Recreation components (@75%):	\$1,833,375
Plus Recreation Cost-Shared Amount (@50%):	<u>+ \$ 63,250</u>
Total USACE Cost-Shared Amount	\$1,896,625

### **Federal Responsibilities**

155. The U.S. Army Corps of Engineers is responsible for budgeting of the Federal share of construction costs for this project. Federal funding is subject to budgetary constraints inherent in the formulation of a national Civil Works budget for a given

Fiscal Year. The Corps would perform the necessary pre-construction, engineering and design needed prior to construction. The Corps would obtain all necessary permits, including water quality certification, and would construct the project.

#### **Non-Federal Sponsor Responsibilities**

156. The non-Federal sponsor shall provide 25 percent of construction and monitoring costs for the ecosystem restoration, plus 50 percent of education and recreation component costs. The non-Federal sponsor must also assume other responsibilities before the project can be constructed. These "items of cooperation" are listed in the Recommendations section of this report. The delineation of Federal and non-Federal responsibilities is legally defined in the PCA.

157. The non-Federal sponsor shall also be responsible for 100 percent of the operations, maintenance, repair, rehabilitation, and replacement (OMRR&R) costs associated with the project modification. The non-Federal sponsor shall provide OMRR&R for the project modification in a manner so that a liability will not arise under the Comprehensive Environmental Response, Compensation and Liability Act.

158. In meeting its responsibilities, the non-Federal sponsor shall provide all lands, easements, relocations, rights-of-way and disposal areas (LERRDs) required for the restoration project that are not otherwise available for the construction of the existing project. The value and credit of LERRDs provided for the ecosystem restoration project by the non-Federal sponsor shall be determined as described in Engineering Regulation 1165-2-131, "Project Cooperation Agreements for New Start Construction Projects" and Engineering Regulation 405-2-12. If the value of the identified LERRDs represents less than 25 percent of the total ecosystem restoration project costs, the non-Federal sponsor shall provide, during the period of implementation, a cash contribution or work-in-kind in the amount necessary to make its total contribution equal to 25 percent. If the value of LERRDs contributions exceeds 25 percent of the total project costs, the Government shall refund the excess to the non-Federal sponsor. However, the non-Federal sponsor shall not receive any credit for LERRDs previously provided as an item of cooperation for another Federal project, nor shall the value thereof be included in the total ecosystem restoration project costs.

159. Because the COM already owns Virginia Key Beach Park, there is no need for the acquisition of any additional interest to proceed with construction of the project. Credits for real estate are limited to administrative and certification review costs. Further, no relocations, easements or rights-of-way will be necessary for implementation of this project.

#### **SUMMARY OF COORDINATION, PUBLIC VIEWS AND COMMENTS**

160. Interagency collaboration through all stages of project development and implementation is paramount to the success of the Civil Works Program. The following coordination has been accomplished for this study: The Jacksonville

District U.S. Army Corps of Engineers is preparing and coordinating the environmental assessment and ecosystem restoration report. The sponsor has provided conceptual design information and topographic data. The U.S. Fish and Wildlife Service has prepared the draft Fish and Wildlife Coordination Act Report which details important resources that are within the project area and opportunities to enhance wildlife values.

161. A scoping letter dated July 24, 2000 was issued during the reconnaissance phase for the proposed project and has been sent to all interested parties including local interests and governments, State and federal agencies. The purpose of this letter is to identify potential problems and opportunities concerning policy and the acceptability of the project as early as possible in the planning process.

162. The Corps issued a public notice March 15, 2002 stating that a preliminary Finding of No Significant Impact (FONSI) and draft EA for the proposed project are available upon request. The public notice was issued to appropriate Federal, State and local agencies, appropriate city and county officials, project sponsors and other parties known to have interest in the project. The scoping letter, public notice, mailing list and letters of response are included in EA Appendix 2 (green pages), included with this report.

163. Appropriate Federal, state and local agencies participated in the reconnaissance and feasibility phases of this study, as well as development of the study schedule and project management plan. A list of these meetings can be found in Appendix H.

164. This ERR and EA were circulated to all major Florida government agencies, and to concerned Federal agencies in Florida for public review and comment. This report contains letters and other pertinent correspondence received as a result of public and interagency meetings and public coordination of the draft ERR and EA. They can be found in Appendix G.

### **Federal Review**

164. Ecosystem restoration reports developed under the general authority of Section 1135 must undergo Department of Army review prior to public dissemination. First, an independent technical review team reviews the draft ERR prior to the alternative formulations briefing (AFB). Based on comments generated at the AFB meeting, the Department either releases the draft report as is or requires modification prior to release.

165. After approval of the draft report for release, Federal and state natural resource agencies, organizations and the interested public may review the draft ERR and NEPA document (in this case an environmental assessment) for a minimum of 45 days. NEPA coordination is completed prior to publication of the Division Engineer's public notice and transmittal of the ecosystem restoration report to higher Department authority for final review and approval. This process in no way



prohibits or restricts the involvement of other Federal and state agencies during the development of the draft report or NEPA document.

#### **Flood Plain Development**

166. The proposed project is in the base flood plain (100-year flood) and has been evaluated in accordance with Executive Order 11988. The project is in compliance with this executive order. Relocation of the project outside of the flood plain would not be responsive to the ecosystem restoration needs of Virginia Key Park, and was not considered. A non-flood plain alternative for the potential development that may be induced as a result of project implementation would be to restrict all future development to those areas outside of the flood plain or elevated above the flood plain. Potential flood plain development as a result of project implementation would not likely occur as the property has been designated as a public park by the City of Miami.

#### **Coastal Barrier Resources**

167. The proposed new Federal investment decision for the Virginia Key ecosystem restoration project does not include any recommendations which would result in any new Federal expenditures or financial assistance prohibited by the Coastal Barrier Resources Act (Public Law 97-348).

#### **Coastal Zone Management**

168. The Coastal Zone Management Act (CZMA) of 1972, as amended (Public Law 92-583) requires all Federal activities inside or outside of a state's coastal zone to be consistent to the maximum extent practicable with the state's coastal zone management plan if the activities affect natural resources, land uses, or water uses within the coastal zone. By review of the Corps' consistency determination and issuance of their concurrence, the State of Florida will, in essence, determine that the project is consistent with the Florida Coastal Zone Management Plan.

### **VII. CONCLUSIONS**

169. The study team concludes that because of the Corps' role in past habitat degradation at Virginia Key, there is a Federal interest in restoring native habitats and ecosystems for the benefit of the public. The recommended plan is feasible and consistent with the purposes of the past and on-going projects that resulted in habitat degradation. The recommended plan will significantly improve the quality of the environment in the public interest at Virginia Key Beach Park and contribute to the restoration of increasingly rare habitats that are of regional significance. The proposed plan will complement previous small-scale restoration work completed at Virginia Key and greatly increase the amount and potential function of the native coastal ecosystem there. In addition, it will complement the function of the Critical Wildlife Area on the western side of the island. It will improve habitat value to fish and wildlife resources, among them a fairly large number of rare, threatened or endangered species. Finally, restoration of native habitats at Virginia Key will complement restoration work completed by the Corps and others on other barrier

and dredged material disposal islands in Biscayne Bay by helping to reduce the seed source for exotic species in the Bay area.

170. The recommended plan is supported by the COM. Based on previous newspaper articles and editorials, and on recommendations made to the COM by the Virginia Key Park Civil Rights Task Force, there appears to be broad public support for restoration and protection of the natural areas at Virginia Key. In fact, ecosystem restoration is important to achievement of the Task Force's goals for the park and designation as a National Historic Landmark and Civil Rights Memorial. The Task Force envisions Virginia Key as one "jewel" in an aquatic string of restored and historical islands in Biscayne Bay.

## **VIII. RECOMMENDATIONS**

171. I have given consideration to all significant aspects of the proposed ecosystem restoration of Virginia Key, including the overall public interest, engineering and economic feasibility, and environmental and social effects. The recommended plan described in this report provides the optimum solution for ecosystem restoration of the study area that can be developed within the framework of the formulation concepts.

172. I recommend that coastal habitats on Virginia Key in Biscayne Bay, Miami-Dade County, Florida be restored under the general authority of Section 1135 of the WRDA of 1986, with such modifications as in the discretion of the Chief of Engineers may be advisable.

173. This recommendation is made with the provision that prior to project implementation, the non-Federal sponsor shall enter into a binding agreement with the Secretary of the Army or his designated representative to perform the following items of cooperation:

- a. Pay 100 percent of any operation, maintenance, repair, replacement, and rehabilitation costs attributable to the restoration project. Management of the area will be assumed by the COM.

- b. Provide all land easements, and rights-of-way, and suitable borrow and dredged or excavated material disposal areas, and perform or ensure the performance of all relocations determined by the Federal Government to be necessary for the implementation, operation, and maintenance of the restoration project.

- c. Provide all improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the implementation, operation, and maintenance of the restoration project. Such improvements may include, but are not limited

to, retaining dikes, water weirs, bulkheads, embankments, monitoring features, stilling basins, and de-watering pumps and pipes.

d. Provide during implementation, any additional amounts as are necessary to make its total contribution equal to 25 percent of the project ecosystem restoration costs and 50 percent of the project recreation costs.

e. For as long as the Virginia Key ecosystem restoration project remains authorized, to operate, maintain, repair, replace, and rehabilitate the completed project, or functional portion of the project, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific direction prescribed by the Federal Government.

f. Grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal sponsor owns or controls for access to the ecosystem restoration project for the purpose of inspection, and, if necessary for the purpose of completing, operating, maintaining, replacing, or rehabilitating the project.

g. Hold and save the United States free from all damages arising from the implementation, operation, maintenance repair, replacement, and rehabilitation of the ecosystem restoration project and any project-related betterment, except for damages due to the fault or negligence of the United States or its contractors.

h. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the ecosystem restoration project in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20.

i. Perform, or cause to be performed, any investigations for hazardous substances as are deemed necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, rights-of-way, that the Federal Government determines to be required for the implementation, operation, and maintenance of the ecosystem restoration project except for any such lands that the Federal Government determines to be subject to the navigation servitude. The Government shall perform, or cause to be performed, all investigations on lands, easements, or rights-of-way that are owned by the United States and administered by the

Federal Government. For lands that the Federal Government determines to be subject to navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the Non-Federal sponsor with prior specific written direction, in which case the Non-Federal sponsor shall perform such investigations in accordance with such written direction.

j. Assume complete financial responsibility, as between the Federal Government and the Non-Federal sponsor, for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for the implementation, operation, or maintenance of the ecosystem restoration project, except for any such lands, easements, or rights-of-way owned by the United States and administered by the Federal Government.

k. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the ecosystem restoration project in a manner that will not cause liability to arise under CERCLA.

l. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way, required for the implementation, operation, and maintenance of the ecosystem restoration project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

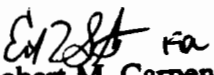
m. Comply with all applicable Federal and State laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352(42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army."

n. Provide 25 percent of that portion of total historic preservation mitigation and data recovery costs attributable to the ecosystem restoration project that are in excess of 1 percent of the total amount authorized to be appropriated for the general navigation features of the project.



o. Under no circumstances shall the total Federal cost of the ecosystem restoration project, including previous study cost, exceed the legislated maximum total cost per project of \$5,000,000.

174. The recommendations contained herein reflect the information at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are authorized under the general provisions of Section 1135 of WRDA 1986, as amended and considered for implementation funding. However, prior to authorization, the non-Federal sponsor, the State of Florida, interested Federal agencies, and other parties will be advised of any modifications and will be afforded the opportunity to comment further.

  
Robert M. Carpenter  
Colonel, Corps of Engineers  
Commanding

ERIK L. STOR  
MAJ, Corps of Engineers  
Deputy Commander

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The primary responsibility for preparation of this document belongs to the U.S. Army Corps of Engineers. The U.S. Fish and Wildlife Service prepared the Coordination Act Report, which was used in preparation of the draft Ecosystem Restoration Report and draft Environmental Assessment.

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**MAY 2006**

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# **Final Environmental Assessment**

**SECTION 1135  
ECOSYSTEM RESTORATION  
VIRGINIA KEY  
DADE COUNTY, FLORIDA**



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
P. O. BOX 4870  
JACKSONVILLE, FLORIDA 32232-0018**

**FINDING OF NO SIGNIFICANT IMPACT**


**SECTION 1135 ECOSYSTEM RESTORATION  
VIRGINIA KEY, DADE COUNTY, FLORIDA**

I have reviewed the Environmental Assessment (EA) for the proposed action. This Finding incorporates by reference all discussions and conclusions contained in the Environmental Assessment enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary:

- a. The proposed action would restore the ecosystem of selected areas on Virginia Key, Florida.
- b. A Fish and Wildlife Coordination Act Report has been prepared and indicates support of the project by the Department of the Interior. The project will meet conditions set forth to comply with the Endangered Species Act and the Fish and Wildlife Coordination Act.
- c. The proposed work has been determined to be consistent with the Florida Coastal Zone Management Program.
- d. Pending completion of consultation with the State Historic Preservation Officer, sites of cultural significance would not be adversely affected.

4 NOV 2005

Date

  
Robert M. Carpenter  
Colonel, U.S. Army  
District Engineer

**DRAFT ENVIRONMENTAL ASSESSMENT  
ON  
SECTION 1135  
ECOSYSTEM RESTORATION  
VIRGINIA KEY  
DADE COUNTY, FLORIDA**

**TABLE OF CONTENTS**

<b>TABLE OF CONTENTS .....</b>	<b>i</b>
<b>1 PROJECT PURPOSE AND NEED .....</b>	<b>1</b>
<b>1.1 PROJECT AUTHORITY .....</b>	<b>1</b>
1.1.1 INITIAL AUTHORIZATION .....	1
1.1.2 SECTION 905(B) (WRDA 86) ANALYSIS .....	1
1.1.3 APPROPRIATION.....	1
<b>1.2 PROJECT LOCATION .....</b>	<b>1</b>
<b>1.3 PROJECT DESCRIPTION.....</b>	<b>2</b>
<b>1.4 PROJECT NEED OR OPPORTUNITY .....</b>	<b>2</b>
<b>1.5 RELATED ENVIRONMENTAL DOCUMENTS.....</b>	<b>2</b>
<b>1.6 DECISIONS TO BE MADE.....</b>	<b>2</b>
<b>1.7 SCOPING AND ISSUES .....</b>	<b>3</b>
1.7.1 ISSUES EVALUATED IN DETAIL .....	3
1.7.2 ISSUES ELIMINATED FROM DETAILED ANALYSIS.....	3
<b>1.8 ENVIRONMENTAL COORDINATION.....</b>	<b>3</b>
1.8.1 WATER QUALITY CERTIFICATION.....	3
1.8.2 FISH AND WILDLIFE COORDINATION ACT REPORT .....	3
1.8.3 ENDANGERED SPECIES ACT- SECTION 7 COORDINATION .....	3
<b>2 ALTERNATIVES .....</b>	<b>4</b>
<b>2.1 DESCRIPTION OF ALTERNATIVES .....</b>	<b>4</b>
2.1.1 ALTERNATIVE 1-NO ACTION .....	4
2.1.2 ALTERNATIVE 2-LOWER KEY RESTORATION .....	4
2.1.3 ALTERNATIVE 2A-LOWER KEY RESTORATION WITH CREATED POND WITH WETLANDS.....	4
2.1.4 ALTERNATIVE 3-MIDDLE KEY RESTORATION.....	4
2.1.5 ALTERNATIVE 4-UPPER KEY RESTORATION.....	4
<b>2.2 PREFERRED ALTERNATIVE .....</b>	<b>4</b>

2.3	ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION .....	5
2.4	COMPARISON OF ALTERNATIVES .....	5
3	AFFECTED ENVIRONMENT .....	9
3.1	GENERAL ENVIRONMENTAL SETTING.....	9
3.1.1	SITE DESCRIPTION .....	9
3.1.2	OWNERSHIP .....	9
3.2	THREATENED AND ENDANGERED SPECIES .....	9
3.2.1	SEA TURTLES.....	9
3.2.1.1	LOGGERHEAD SEA TURTLE.....	9
3.2.1.2	OTHER SEA TURTLES.....	9
3.2.1.3	AMERICAN CROCODILE.....	10
3.2.1.4	WEST INDIAN MANATEE.....	10
3.2.1.5	Bald Eagle.....	10
3.2.1.6	WOOD STORK.....	10
3.2.1.7	BEACH JACQUEMONTIA.....	10
3.3	VEGETATION.....	10
3.3.1	TROPICAL HARDWOOD HAMMOCK.....	10
3.3.2	COASTAL STRAND.....	11
3.3.3	WETLANDS.....	11
3.3.4	RUDERAL AREAS.....	11
3.4	FISH AND WILDLIFE RESOURCES.....	11
3.5	WATER QUALITY .....	11
3.6	HAZARDOUS, TOXIC AND RADIOACTIVE WASTE .....	12
3.7	SOCIO-ECONOMICS .....	12
3.8	CULTURAL RESOURCES.....	12
3.9	RECREATIONAL RESOURCES .....	12
3.10	AESTHETICS.....	12
4	ENVIRONMENTAL EFFECTS .....	13
4.1	GENERAL ENVIRONMENTAL EFFECTS.....	13
4.2	THREATENED AND ENDANGERED SPECIES .....	13
4.2.1	ALTERNATIVE 1-NO ACTION.....	13
4.2.1.1	SEA TURTLES.....	13
4.2.1.2	AMERICAN CROCODILE.....	13
4.2.1.3	WEST INDIAN MANATEE.....	13
4.2.1.4	BALD EAGLE.....	13
4.2.1.5	WOOD STORK.....	13
4.2.1.6	BEACH JACQUEMONTIA.....	13
4.2.2	SELECTED PLAN .....	14
4.2.2.1	SEA TURTLES .....	14
4.2.2.2	AMERICAN CROCODILE.....	14
4.2.2.3	WEST INDIAN MANATEE.....	14
4.2.2.4	BALD EAGLE.....	14
4.2.2.5	WOOD STORK.....	14
4.2.2.6	BEACH JACQUEMONTIA.....	14



4.2.3	ALTERNATIVE 2-LOWER KEY RESTORATION .....	15
4.2.3.1	SEA TURTLES .....	15
4.2.3.2	AMERICAN CROCODILE .....	15
4.2.3.3	WEST INDIAN MANATEE .....	15
4.2.3.4	BALD EAGLE .....	15
4.2.3.5	WOOD STORK .....	15
4.2.3.6	BEACH JACQUEMONTIA .....	15
4.2.4	ALTERNATIVE 2A-LOWER KEY RESTORATION WITH CREATED POND WITH WETLANDS .....	15
4.2.4.1	SEA TURTLES .....	15
4.2.4.2	AMERICAN CROCODILE .....	15
4.2.4.3	WEST INDIAN MANATEE .....	15
4.2.4.4	BALD EAGLE .....	15
4.2.4.5	WOOD STORK .....	15
4.2.4.6	BEACH JACQUEMONTIA .....	15
4.2.5	ALTERNATIVE 3-MIDDLE KEY RESTORATION .....	15
4.2.5.1	SEA TURTLES .....	15
4.2.5.2	AMERICAN CROCODILE .....	15
4.2.5.3	WEST INDIAN MANATEE .....	16
4.2.5.4	BALD EAGLE .....	16
4.2.5.5	WOOD STORK .....	16
4.2.5.6	BEACH JACQUEMONTIA .....	16
4.2.6	ALTERNATIVE 4-UPPER KEY RESTORATION .....	16
4.2.6.1	SEA TURTLES .....	16
4.2.6.2	AMERICAN CROCODILE .....	16
4.2.6.3	WEST INDIAN MANATEE .....	16
4.2.6.4	BALD EAGLE .....	16
4.2.6.5	WOOD STORK .....	16
4.2.6.6	BEACH JACQUEMONTIA .....	16
4.3	VEGETATION .....	17
4.3.1	PROPOSED ACTION, ALTERNATIVES 2, 3, AND 4 .....	17
4.3.1.1	TROPICAL HARDWOOD HAMMOCK .....	17
4.3.1.2	COASTAL STRAND .....	17
4.3.1.3	POND WITH WETLANDS .....	17
4.3.1.4	WETLANDS .....	18
4.3.2	ALTERNATIVE COMPARISON .....	18
4.4	FISH AND WILDLIFE RESOURCES .....	18
4.4.1	PROPOSED ACTION, ALTERNATIVES 2, 3, AND 4 .....	18
4.4.2	ALTERNATIVE 2-LOWER KEY .....	18
4.4.3	ALTERNATIVE 2A-LOWER KEY WITH CREATED POND WITH WETLANDS .....	18
4.4.4	ALTERNATIVE 3-MIDDLE KEY .....	18
4.4.5	ALTERNATIVE 4-UPPER KEY .....	19
4.4.6	ALTERNATIVE 1-NO ACTION .....	19
4.5	WATER QUALITY .....	19
4.6	HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE .....	19
4.7	SOCIO-ECONOMIC .....	19
4.8	CULTURAL RESOURCES .....	19
4.9	RECREATION .....	19
4.10	AESTHETICS .....	19

<b>4.11</b>	<b>CUMULATIVE IMPACTS.....</b>	<b>19</b>
<b>4.12</b>	<b>IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES.....</b>	<b>20</b>
4.12.1	IRREVERSIBLE.....	20
4.12.2	IRRETRIEVABLE.....	20
<b>4.13</b>	<b>UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS.....</b>	<b>20</b>
<b>4.14</b>	<b>LOCAL SHORT-TERM USES AND MAINTENANCE/ENHANCEMENT OF LONG-TERM PRODUCTIVITY .....</b>	<b>20</b>
<b>4.15</b>	<b>INDIRECT EFFECTS.....</b>	<b>20</b>
<b>4.16</b>	<b>COMPATIBILITY WITH FEDERAL, STATE, AND LOCAL OBJECTIVES .....</b>	<b>20</b>
<b>4.17</b>	<b>CONFLICTS AND CONTROVERSY .....</b>	<b>20</b>
<b>4.18</b>	<b>UNCERTAIN, UNIQUE, OR UNKNOWN RISKS .....</b>	<b>20</b>
<b>4.19</b>	<b>PRECEDENT AND PRINCIPLE FOR FUTURE ACTIONS.....</b>	<b>20</b>
<b>4.20</b>	<b>ENVIRONMENTAL COMMITMENTS .....</b>	<b>20</b>
<b>4.21</b>	<b>COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS .....</b>	<b>21</b>
4.21.1	NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.....	21
4.21.2	ENDANGERED SPECIES ACT OF 1973.....	21
4.21.3	FISH AND WILDLIFE COORDINATION ACT OF 1958.....	22
4.21.4	NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA) .....	22
4.21.5	CLEAN WATER ACT OF 1972 .....	22
4.21.6	CLEAN AIR ACT OF 1972 .....	22
4.21.7	COASTAL ZONE MANAGEMENT ACT OF 1972 .....	22
4.21.8	FARMLAND PROTECTION POLICY ACT OF 1981.....	22
4.21.9	WILD AND SCENIC RIVER ACT OF 1968 .....	22
4.21.10	MARINE MAMMAL PROTECTION ACT OF 1972.....	22
4.21.11	ESTUARY PROTECTION ACT OF 1968.....	22
4.21.12	FEDERAL WATER PROJECT RECREATION ACT.....	22
4.21.13	FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976.....	22
4.21.14	SUBMERGED LANDS ACT OF 1953 .....	23
4.21.15	COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990.....	23
4.21.16	RIVERS AND HARBORS ACT OF 1899.....	23
4.21.17	ANADROMOUS FISH CONSERVATION ACT.....	23
4.21.18	MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT .....	23
4.21.19	MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT.....	23
4.21.20	MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT.....	23
4.21.21	E.O. 11990, PROTECTION OF WETLANDS .....	23
4.21.22	E.O. 11988, FLOOD PLAIN MANAGEMENT .....	23
4.21.23	E.O. 12898, ENVIRONMENTAL JUSTICE.....	23
4.21.24	E.O. 13089, CORAL REEF PROTECTION .....	24
4.21.25	E.O. 13112, INVASIVE SPECIES .....	24
<b>5</b>	<b>LIST OF PREPARERS.....</b>	<b>25</b>
<b>5.1</b>	<b>PREPARERS .....</b>	<b>25</b>
<b>5.2</b>	<b>REVIEWERS.....</b>	<b>25</b>
<b>6</b>	<b>PUBLIC INVOLVEMENT .....</b>	<b>26</b>

<b>6.1</b>	<b>SCOPING AND DRAFT EA .....</b>	<b>26</b>
<b>6.2</b>	<b>AGENCY COORDINATION .....</b>	<b>26</b>
<b>6.3</b>	<b>COMMENTS RECEIVED AND RESPONSE .....</b>	<b>26</b>
	<b>REFERENCES .....</b>	<b>28</b>
	<b>APPENDIX 1 – SECTION 404(B) EVALUATION .....</b>	<b>30</b>
	<b>APPENDIX 2 - COASTAL ZONE MANAGEMENT CONSISTENCY .....</b>	<b>37</b>
	<b>APPENDIX 3 – PERTINENT CORRESPONDENCE .....</b>	<b>41</b>
	<b>APPENDIX 4 – HABITAT UNIT CALCULATION .....</b>	<b>42</b>

#### **LIST OF TABLES**

<b>Table 1</b>	<b>Summary of Direct and Indirect Impacts of Alternatives Considered .....</b>	<b>6</b>
<b>Table 2</b>	<b>Sea Turtle Nesting Data for Virginia Key, 1991-2000 .....</b>	<b>9</b>

**DRAFT ENVIRONMENTAL ASSESSMENT  
ON  
SECTION 1135  
ECOSYSTEM RESTORATION  
VIRGINIA KEY  
DADE COUNTY, FLORIDA**

**1 PROJECT PURPOSE AND NEED**

**1.1 PROJECT AUTHORITY**

**1.1.1 INITIAL AUTHORIZATION**

Section 1135 of the Water Resources Development Act of 1986 (WRDA 86), Public Law 99-662, as amended, authorizes the U.S. Army Corps of Engineers (Corps) to make modifications in its water resources projects, if determined that the modifications are: (1) feasible and consistent with the authorized project purposes, and (2) will improve the quality of the environment in the public interest. The primary benefits from Section 1135 modifications must be associated with improvements to fish and wildlife resources. Projects constructed by the Corps on Virginia Key and related to the proposed action include: a 66-acre dredged material management area along the island's northern terminus which continues to be used for federal navigation improvements, and; the placement of beach quality sand and groins along 1.8 miles of the seaward shoreline for shore protection.

**1.1.2 SECTION 905(B) (WRDA 86)  
ANALYSIS**

A preliminary report, completed in July 2000, recommended that feasibility phase studies be undertaken for environmental restoration of selected areas on Virginia Key.

**1.1.3 APPROPRIATION**

Federal project modification costs for Section 1135 modifications cannot exceed \$5 million, including studies, plans and specifications, and construction. Specific funding is appropriated from the Continuing Authorities Program. Congressional authorization would be required for any proposed modifications in excess of \$5 million. Section 1135 projects are cost shared with the federal portion being 75% and the remaining 25% paid by a non-federal sponsor, in this case the City of Miami. Operation and maintenance associated with the project modification are the responsibility of the non-federal sponsor.

**1.2 PROJECT LOCATION**

Virginia Key is a barrier island located in Township 54, Range 42, sections 16 and 17 of the City of Miami, Dade County, Florida. The island lies within Biscayne Bay and is situated south of Fisher Island, north of Key Biscayne, bordering the Atlantic Ocean to the east and Biscayne Bay to the west. The proposed restoration would occur within the 132-acre Virginia Key Beach Park that is owned and operated by the City of Miami (see ERR Figure 1, Site Map). The park lies adjacent to the federal projects previously described in Section 1.1.1.

### **1.3 PROJECT DESCRIPTION**

The proposed environmental restoration would occur within selected areas of Virginia Key Beach Park (see ERR, Figure 12). Project features would include the removal of exotic vegetation from disturbed habitat. These areas, while heavily infested with exotics, still have remnant elements of native tropical hardwood hammock and coastal strand plant communities. Indigenous species of trees, shrubs and herbaceous vegetation would be planted in the larger areas where the dominant exotics had been eliminated. Scattered throughout the restoration area are water-filled ditches and fresh or brackish-water ponds. Exotic invasive species would be removed from these areas and native species would be planted. A multi-purpose trail is also being planned in order to provide access throughout a portion of the park.

### **1.4 PROJECT NEED OR OPPORTUNITY**

Pursuant to Section 1135 of WRDA 1986, the City of Miami working in close association with the Virginia Key Park Civil Rights Task Force requested that the Corps restore the natural environment of Virginia Key Beach Park. The park lies within or is adjacent to the previously mentioned Corps projects. A significant portion of the park, an estimated 77 acres, is presently under consideration for designation as a National Historic Area. The ecosystem restoration work would be performed in concert with the expected designation. This would be important to local entities that are interested in protecting historical as well as environmental characteristics of the island. The proposed action would not only complement the designation as a National Historic Area, but would certainly enhance local fish and wildlife resources by restoring biologically diverse habitat types that have significantly declined in the greater Miami area.

### **1.5 RELATED ENVIRONMENTAL DOCUMENTS**

The following is a list of related documents:

1. Section 1135 Ecosystem Restoration Report and Environmental Assessment, Munyon Island, Palm Beach County, Florida. U. S. Army Corps of Engineers, Jacksonville District, 1995.
2. Section 1135 Ecosystem Restoration Report and Environmental Assessment, Peanut Island, Palm Beach County, Florida. U. S. Army Corps of Engineers, Jacksonville District, 2000.
3. Section 1135 Ecosystem Restoration Report and Environmental Assessment, John's Island, Palm Beach County, Florida. U. S. Army Corps of Engineers, Jacksonville District, 2001.
4. Section 111 Shoreline Stabilization Report and Draft Environmental Assessment, Virginia Key, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, 2002.
5. Draft Section 206 Ecosystem Restoration Report and Environmental Assessment, Dinner Key, Florida. U. S. Army Corps of Engineers, Jacksonville District, in progress.

### **1.6 DECISIONS TO BE MADE**

This Environmental Assessment will evaluate whether to perform the proposed ecosystem restoration on Virginia Key and, if so, evaluate alternatives to accomplish that goal.



## **1.7 SCOPING AND ISSUES**

### **1.7.1 ISSUES EVALUATED IN DETAIL**

The following issues were identified to be relevant to the proposed action and appropriate for detailed evaluation: (1) impacts to protected species occurring or potentially occurring within the project area (i.e., sea turtles, American crocodile, West Indian manatee, wood stork, bald eagle, and beach jacquemontia); (2) disturbance to native plant communities as well as other fish and wildlife resources; (3) water quality degradation caused by restoration activities; (4) potential presence or release of hazardous, toxic, or radioactive waste (HTRW); (5) socio-economic impacts to individuals, families, and businesses harmed by or benefiting by the project; (6) enhancement or denigration to cultural resources or historic properties; (7) impacts to recreational use; (8) modification of local aesthetic qualities.

### **1.7.2 ISSUES ELIMINATED FROM DETAILED ANALYSIS**

The following issues were not considered relevant to the proposed action: (1) sea grasses, coral reefs, Essential Fish Habitat, and protected species under the purview of the National Marine Fisheries Service since no work is being planned within coastal waters and no material is to be placed on the beach; (2) the proposed action is

expected to have little or no impact on air quality, noise, soils, housing, or population dynamics.

## **1.8 ENVIRONMENTAL COORDINATION**

### **1.8.1 WATER QUALITY CERTIFICATION**

Pursuant to Section 401 of the Clean Water Act, the Corps is in the process of coordinating the proposed action with the Florida Department of Environmental Protection. All State water quality standards would be met. This project is also subject to review by the State of Florida in accordance with the Coastal Zone Management Plan.

### **1.8.2 FISH AND WILDLIFE COORDINATION ACT REPORT**

For this action, a Fish and Wildlife Coordination Act final report from the U.S. Fish and Wildlife Service (USFWS) was received on 6 August 2002 pursuant to Section 2(b) of the Act (see Appendix C).

### **1.8.3 ENDANGERED SPECIES ACT- SECTION 7 COORDINATION**

In accordance with Section 7 of the Endangered Species Act, the Corps has coordinated with the USFWS in regards to the proposed action. A response from the USFWS was received on 6 August 2002 (see Appendix C).

## **2 ALTERNATIVES**

The alternatives section is perhaps the most important component of this EA. It describes the no-action alternative, the proposed action, and other reasonable alternatives that were studied in detail. The beneficial and adverse environmental effects of the alternatives are presented in comparative form, providing a clear basis for choice to the decisionmaker and the public. A preferred alternative was selected based on the information and analysis presented in the sections on the Affected Environment and Probable Impacts.

### **2.1 DESCRIPTION OF ALTERNATIVES**

#### **2.1.1 ALTERNATIVE 1-NO ACTION (STATUS QUO)**

If no action were taken, the exotic vegetation would most likely continue to spread resulting in the continued decline of plants, animals, and ecosystems native to Virginia Key. In some cases, benefits from past partial restoration could be lost. The no action alternative is not a viable option.

#### **2.1.2 ALTERNATIVE 2-LOWER KEY RESTORATION**

Ecosystem restoration efforts would be limited to selectively clearing exotic vegetation and replanting native species within the 77-acre historical portion of the Virginia Key Beach Park or Lower Key (see ERR Figure 7). This area has been identified by the local sponsor as having the highest restoration priority due to the cultural significance of the site. A total of 8.2 acres of dune/coastal strand, 24.2 acres of tropical hardwood hammock, 0.7 acres of wetlands, and 3.2 acres of pond with wetland fringe would be restored.

#### **2.1.3 ALTERNATIVE 2A-LOWER KEY RESTORATION WITH CREATED**

### **POND WITH WETLAND HABITAT**

This alternative would selectively clear exotic vegetation and replant native species within the Lower Key (see ERR Figure 8). A total of 8.2 acres of dune/coastal strand, 22.1 acres of tropical hardwood hammock, 0.7 acres of wetlands, and 5.3 acres of pond with wetland fringe would be restored or created.

#### **2.1.4 ALTERNATIVE 3-MIDDLE KEY RESTORATION**

This alternative would selectively clear exotic vegetation and replant native species in the Middle Key area just north of Virginia Key Beach Park (see ERR Figure 9). A total of 3.4 acres of dune/coastal strand, 9.2 acres of tropical hardwood hammock, and 6.6 acres of wetlands would be restored.

#### **2.1.5 ALTERNATIVE 4-UPPER KEY RESTORATION**

This alternative would selectively clear exotic vegetation species and replant native species in the northern section of the study area or "Upper Key" (see ERR Figure 10). A total of 2.1 acres of dune/coastal strand and 1.5 acres of tropical hardwood hammock would be restored.

### **2.2 PREFERRED ALTERNATIVE**

A combination of alternatives 2, 3, and 4 (Lower, Middle, and Upper Key Restoration) is the preferred alternative. This alternative provides the best overall value according to the incremental analysis performed for this project (refer to the Ecosystem Restoration Report for further discussion).

## **2.3 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION**

The following restoration alternatives, some of which were described in the 905b report, have been eliminated from further analysis:

1. Placement of sand on the beach along the eastern shoreline of Virginia Key, north of the proposed Section 111 project. This alternative was eliminated due to potential impacts on nesting sea turtles and seagrass at this location.
2. Removal of fill material from the mangrove community adjacent to the mulching operation and sewage treatment plant located on the northwest side of the island. This particular action was eliminated because it was considered a low priority area with the local sponsor, and because the National Oceanic and Atmospheric Administration (NOAA) has expressed an interest in using this area for mitigation purposes.
3. Increasing the hydrologic connection between the previously mentioned mangrove community and a remnant wetland to the south via the installation of a culvert. This alternative was eliminated because of difficulties in placing the culvert under an existing road that has several utility lines underneath it.
4. Connecting a ditch in the Middle Key area with the eastern shoreline by extending the ditch or installing a culvert. This alternative was eliminated due to impacts to existing sea grass and difficulties in keeping the connection open.

## **2.4 COMPARISON OF ALTERNATIVES**

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. See section 4.0 Environmental Effects for a more detailed discussion of impacts of alternatives.

Table 1: Summary of Direct and Indirect Impacts

ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative 1-No Action (Status Quo)	Alternative 2-Lower Key Restoration	Alternative 2A-Lower Key Restoration with New Pond and Fringe Wetland	Alternative 3-Middle Key Restoration	Alternative 4-Upper Key
SEA TURTLES	Removal of exotic vegetation may have slightly increased available nesting habitat. Planting of coastal strand native species may have helped stabilize shoreline.	Exotic vegetation removal is unlikely to adversely affect nesting sea turtles. Monitoring and/or avoidance of nesting areas would be implemented. Removal of exotic vegetation may slightly increase available nesting space.	Exotic vegetation removal is unlikely to adversely affect nesting sea turtles. Monitoring and/or avoidance of nesting areas would be implemented. Removal of exotic vegetation may slightly increase available nesting space.	Exotic vegetation removal is unlikely to adversely affect nesting sea turtles. Monitoring and/or avoidance of nesting areas would be implemented. Removal of exotic vegetation may slightly increase available nesting space.	Exotic vegetation removal is unlikely to adversely affect nesting sea turtles. Monitoring and/or avoidance of nesting areas would be implemented. Removal of exotic vegetation may slightly increase available nesting space.
AMERICAN CROCODILE	Clearing of dense exotics adjacent to existing ponds and construction of the new pond may have increased potential habitat.	Exotic vegetation removal is unlikely to adversely affect crocodiles. Contractors would be instructed on how to minimize disturbance to this species if present. Clearing of exotic vegetation may increase access to existing ponds.	Exotic vegetation removal is unlikely to adversely affect crocodiles. Contractors would be instructed on how to minimize disturbance to this species if present. Clearing of exotic vegetation and construction of pond may increase potential habitat.	Exotic vegetation removal is unlikely to adversely affect crocodiles. Contractors would be instructed on how to minimize disturbance to this species if present. Clearing of exotic vegetation may increase potential habitat.	Exotic vegetation removal is unlikely to adversely affect crocodiles. Contractors would be instructed on how to minimize disturbance to this species if present. Clearing of exotic vegetation may increase potential habitat.
WEST INDIAN MANATEE	No effect.	No effect anticipated. Interior ponds and channels not connected to coastline.	No effect anticipated. Interior ponds and channels not connected to coastline.	No effect anticipated. Interior ponds and channels not connected to coastline.	No effect anticipated. Interior ponds and channels not connected to coastline.
BALD EAGLE	No effect.	No effect anticipated.	No effect anticipated.	No effect anticipated.	No effect anticipated.

ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative 1-No Action (Status Quo)	Alternative 2-Lower Key Restoration	Alternative 2A-Lower Key Restoration with New Pond and Fringe Wetland	Alternative 3-Middle Key Restoration	Alternative 4-Upper Key
WOOD STORK	Construction of the pond may have slightly increased foraging habitat.	No effect anticipated.	Construction of pond may increase foraging habitat.	No effect anticipated.	No effect anticipated.
BEACH JACQUEMONTIA	Failure to remove the exotic vegetation would most likely have an adverse impact on this species.	The proposed action should benefit this species by removing dense exotic vegetation.	The proposed action should benefit this species by removing dense exotic vegetation.	The proposed action should benefit this species by removing dense exotic vegetation.	The proposed action should benefit this species by removing dense exotic vegetation.
VEGETATION	Long-term adverse impact to native plant communities caused by invasive and dominating exotic plants.	Long-term benefit to native plant communities. Minor short-term disturbance to remaining native plants.	Long-term benefit to native plant communities. Minor short-term disturbance to remaining native plants.	Long-term benefit to native plant communities. Minor short-term disturbance to remaining native plants.	Long-term benefit to native plant communities. Minor short-term disturbance to remaining native plants.
FISH AND WILDLIFE RESOURCES	Long-term adverse impact to those species dependent on native plant communities.	Long-term benefit to those species dependent on native plant communities.	Long-term benefit to those species dependent on native plant communities.	Long-term benefit to those species dependent on native plant communities.	Long-term benefit to those species dependent on native plant communities.
WATER QUALITY	No effect.	No effect anticipated.	No effect anticipated.	No effect anticipated.	No effect anticipated.
HTRW	No effect.	No effect anticipated.	No effect anticipated.	No effect anticipated.	No effect anticipated.
SOCIO-ECONOMICS	Long-term adverse impact to local community.	Long-term benefit to local community.	Long-term benefit to local community.	Long-term benefit to local community.	Long-term benefit to local community.
CULTURAL RESOURCES	No effect.	Beneficial no adverse effect to the historic park.	Beneficial no adverse effect to the historic park. Effects to cultural resources outside of the park will be avoided by project design.	Beneficial no adverse effect to the historic park. Effects to cultural resources outside of the park will be avoided by project design.	Beneficial no adverse effect to the historic park. Effects to cultural resources outside of the park will be avoided by project design.



ALTERNATIVE ENVIRONMENTAL FACTOR	Alternative 1-No Action (Status Quo)	Alternative 2-Lower Key Restoration	Alternative 2A-Lower Key Restoration with New Pond and Fringe Wetland	Alternative 3-Middle Key Restoration	Alternative 4-Upper Key
RECREATIONAL RESOURCES	Not constructing the multi-purpose trail would have a moderate adverse impact on the park's recreational opportunities.	Proposed multi-purpose trail, benches, and interpretive signage would provide a long-term benefit to the park. Footprint of trail would have a minor impact on existing vegetation.	Proposed multi-purpose trail and interpretive signage would provide a long-term benefit to the park. Footprint of trail would have a minor impact on existing vegetation.	Proposed multi-purpose trail and interpretive signage would provide a long-term benefit to the park. Footprint of trail would have a minor impact on existing vegetation.	Proposed multi-purpose trail and interpretive signage would provide a long-term benefit to the park. Footprint of trail would have a minor impact on existing vegetation.
AESTHETICS	Long-term adverse impact by not enhancing the park.	Long-term benefit by enhancing the park. Short-term disturbance caused by restoration activities.	Long-term benefit by enhancing the park. Short-term disturbance caused by restoration activities.	Beneficial no adverse effect to the historic park. Effects to cultural resources outside of the park will be avoided by project design.	Beneficial no adverse effect to the historic park. Effects to cultural resources outside of the park will be avoided by project design.

### 3 AFFECTED ENVIRONMENT

The Affected Environment section succinctly describes the existing environmental resources of the areas that would be affected if any of the alternatives were implemented. This section describes only those environmental resources that would be affected by the alternatives if they were implemented, not the entire existing environment. This section and the description of the "no-action" alternative provide the basic information for determining the environmental impacts of the proposed action and reasonable alternatives.

#### 3.1 GENERAL ENVIRONMENTAL SETTING

##### 3.1.1 SITE DESCRIPTION

Early records indicate that Virginia Key was formerly comprised of two barrier islands, both separate from the mainland (Corps Sounding Chart 1915; Corps Survey Map 1921; Ransom et al. 2001). Comparison of these historical documents with recent aerial photographs also shows that the morphology of the islands has significantly changed due to development. Today, a single island is present and its size, currently an estimated 1,253 acres, has grown considerably as a result of filling associated with various construction projects. Most notable perhaps are the Rickenbacker Causeway, the marine stadium, and a large sewage treatment plant. Other projects, which have physically altered the island, are the municipal landfill, additional road building, parking lots, and the previously mentioned construction performed by the Corps. The northwestern portion of the island remains relatively intact and has been designated a Critical Wildlife Area.

##### 3.1.2 OWNERSHIP

The City of Miami owns most of the island including the 132-acre Virginia Key Beach Park.

#### 3.2 THREATENED AND ENDANGERED SPECIES

##### 3.2.1 SEA TURTLES

###### 3.2.1.1 LOGGERHEAD SEA TURTLE

The following table summarizes loggerhead sea turtle (*Caretta caretta*) nesting activity on Virginia Key from 1991 through 2000. The overwhelming majority of the nests for this threatened species were recorded from the northeast shoreline of the island, which lies within the project area.

TABLE 2. SEA TURTLE NESTING DATA FOR VIRGINIA KEY, 1991-2000.

YEAR	NESTS #	FALSE CRAWLS #
1991	37	75
1992	14	31
1993	40	89
1994	52	100
1995	68	110
1996	53	69
1997	62	175
1998	68	132
1999	64	78
2000	80	192

Source: Ms. Wendy Teas,  
National Marine Fisheries Service

According to the Florida Fish and Wildlife Conservation (FWC) sea turtle nesting database, the first loggerhead nest date and last nest date recorded for Virginia Key were 05/03/95 and 08/15/96 respectively.

###### 3.2.1.2 OTHER SEA TURTLES

FWC records indicate that one endangered hawksbill sea turtle (*Eretomochelys imbricata*) nested on Virginia Key in 1995. Nesting by other species of sea turtles has

not been observed on the island (W. Teas, National Marine Fisheries Service, 2002, personal communication).

### 3.2.1.3 AMERICAN CROCODILE

According to the USFWS recovery plan for the American crocodile (*Crocodylus acutus*), the designated critical habitat for this species does not include Virginia Key (USFWS 1999). However, the USFWS has stated that suitable habitat for this endangered species occurs within the mangrove/lagoon system along the northwest side of the island. This particular area is outside the proposed restoration project. Crocodiles have also been frequently observed in Bill Baggs/Cape Florida State Park on Key Biscayne (G. Milano, Department of Environmental Resource Management (DERM)-Dade County, 2002, personal communication). They may occur within the project area on Virginia Key but have not been observed during recent site inspections.

### 3.2.1.4 WEST INDIAN MANATEE

The endangered West Indian manatee (*Trichechus manatus*) commonly occurs in Biscayne Bay (Hartman 1974; Powell and Rathbun 1984).

### 3.2.1.5 BALD EAGLE

Bald eagles (*Haliaeetus leucocephalus*), as well as their nests, have not been observed during recent site inspections on Virginia Key. A search of the FWC bald eagle database indicates no nests of this threatened species have been recorded on the island.

### 3.2.1.6 WOOD STORK

The wood stork (*Mycteria americana*) has been known to nest in the Miami-Dade County area (U.S. Fish and Wildlife Service 1999). This endangered species may at times use the aquatic habitats on the island for feeding purposes. However, Department of Environmental Resource

Management personnel and Corps biologists have not observed the stork on Virginia Key.

### 3.2.1.7 BEACH JACQUEMONTIA

The beach jacquemontia (*Jacquemontia reclinata*), a member of the morning glory family, was known to occur on Virginia Key during the early 1990's. However, DERM-Dade County personnel have not recently observed this federally endangered plant on the island. It typically inhabits disturbed or sunny areas in tropical maritime hammock (hardwood forest) or coastal strand vegetation, often in association with sea grape (*Coccoloba uvifera*) and other shrubs and dwarfed trees (USFWS 1996).

## 3.3 VEGETATION

### 3.3.1 TROPICAL HARDWOOD HAMMOCK

Approximately 33.1 acres of tropical hardwood hammock can be found throughout a significant portion of the study area. This rare plant community has greatly declined in south Florida as a result of development (Snyder et al. 1990; Hartman 1992). The Parks and Recreation Department of the City of Miami identified the hammock habitat in the Middle Key area as having perhaps the greatest remaining diversity of native plant species including: Spanish stopper (*Eugenia foetida*), Simpson stopper (*Myrcianthes fragrans*), strangler fig (*Ficus aurea*), cocoplum (*Chrysobalanus icaco*), pigeon plum (*Coccoloba diversifolia*), mastic (*Mastichodendron foetidissimum*), indigo berry (*Randia aculeata*), wild coffee (*Psychotria nervosa*), wild lime (*Zanthoxylum fagara*), Florida privet (*Foresteria segregata*), seven year apple (*Cassia clusiifolia*), torchwood (*Amyris elemifera*), and Biscayne prickly ash (*Zanthoxylum coriaceum*), which is listed as endangered by the Florida Department of Agriculture & Consumer Services. City personnel have removed a

significant percentage of exotic plant species from the Alternative 3 area including Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), Seaside mahoe (*Thespesia populnea*), latherleaf (*Colubrina asiatica*), papaya (*Cariaca papaya*), and Burma reed (*Neyraudia reynaudiana*). Other hammocks within the project area remain heavily infested with exotic vegetation.

### 3.3.2 COASTAL STRAND

An estimated total of 16.7 acres of coastal strand can be found within the study area. Species typically found in this type of plant community, such as sea oats (*Uniola paniculata*) and railroad vine (*Ipomea pes-caprae*), can be readily observed here. City personnel have also identified less common plant species in these locations such as burrowing four o'clock (*Okenia hypogaea*), which is listed as a state endangered species by the Florida Department of Agriculture and Consumer Services. Beach naupaka (*Scaevola sericea*), a particularly invasive exotic, can be found in many parts of the coastal strand community.

### 3.3.3 WETLANDS

Scattered throughout the restoration area are remnant ditches which at times hold water and fresh or brackish-water ponds. These wetlands have no surface water connection to the waters surrounding Virginia Key (except possibly during a storm surge). However, the wetlands apparently are considered "adjacent" and jurisdictional in accordance with regulations (33 CFR 328.3(d)). These regulations indicate that wetlands separated from the waters surrounding Virginia Key by "beach dunes and the like" are considered "adjacent". The fresh or brackish water ponds have a fringe of vegetation around them dominated by wetland obligate species. City personnel have identified red mangroves (*Rhizophora mangle*), white mangroves (*Laguncularia racemosa*), black mangroves (*Avicennia*

*germinans*), and green buttonwood (*Conocarpus erectus*). Areas dominated by mangroves and transitional wetlands total an estimated 13.6 acres.

### 3.3.4 RUDERAL AREAS

Approximately 37.9 acres of ruderal habitat which are primarily maintained in grass can be found within the Lower and Middle Key areas. Historically, these locations have been used for parking and staging of public events.

## 3.4 FISH AND WILDLIFE RESOURCES

Unlike the flora, which is predominately West Indian, the fauna of areas like Virginia Key is derived almost completely from southeastern temperate North America (Robertson and Kushlan 1984; Layne 1984). Exceptions to this rule are species that can fly or are capable of surviving a long transport across open water on floating debris (Snyder et al. 1990). Of particular importance, habitat areas in southeast Florida that contain diverse native vegetation are heavily utilized by migrating neo-tropical species of birds that may winter in the Caribbean or southeast Florida such as black-throated blue warbler (*Dendroica caerulescens*), American redstart (*Setophaga ruticilla*), and Louisiana waterthrush (*Seiurus motacilla*).

## 3.5 WATER QUALITY

Pursuant to the state of Florida, rule 62-302.400, the waters surrounding Virginia Key have been designated as Class III Waters, suitable for recreation as well as propagation and maintenance of a healthy and well-balanced population of fish and wildlife. In addition to this classification, the waters within Biscayne National Park have been designated by the state, pursuant to rule 62-302.700, as Florida Outstanding Waters.

### **3.6 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE**

The Hazardous, Toxic or Radioactive Waste (HTRW) preliminary assessment indicated no evidence of HTRW within the study area. A search of the HTRW database also indicated no HTRW related issues within the project area. An inactive municipal landfill, however, does exist just north of the proposed project within the central portion of the island.

significant degradation of the once highly regarded aesthetic qualities of this island.

### **3.7 SOCIO-ECONOMICS**

Use of Virginia Key by the public is currently extremely limited. This being the case, the island is not considered an important attraction for the local tourism industry.

### **3.8 CULTURAL RESOURCES**

Virginia Key Beach Park has been nominated to the National Register of Historic Places based on its association with segregation and the Civil Rights Movement. Many of the Park's original buildings are still extant. A prehistoric site (8DA6) has been reported in the northern portion of the project area. This site was originally reported in the 1920's as a shell midden. Two cultural resource surveys have been conducted for the project area, no historic property other than the historic park was identified (Ramsom et al. 2001, and Cantley 2002).

No evidence of the prehistoric site (8DA6) was located in the project area.

### **3.9 RECREATIONAL RESOURCES**

Recreational opportunities are considered limited due to the moderate condition of existing facilities as well as the beach. There is a trail system that accesses certain areas within the park.

### **3.10 AESTHETICS**

Virginia Key, at one time, was considered by many to be a picturesque barrier island. Development, neglect, and the invasion of exotic plant species, however, have caused



## 4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. See Table 1 in the ERR, for a summary of effects. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

### 4.1 GENERAL ENVIRONMENTAL EFFECTS

The primary purpose of the proposed project is to restore native plant communities, which should increase the diversity of indigenous species of wildlife.

### 4.2 THREATENED AND ENDANGERED SPECIES

In accordance with Section 7 of the Endangered Species Act, coordination with the U.S. Fish and Wildlife Service (USFWS) was conducted regarding possible impacts caused by the proposed action to listed species known to occur in or near the project area. The USFWS concurred with the Corps' determination that the proposed action would not affect the endangered West Indian manatee (*Trichechus manatus*), threatened bald eagle (*Haliaeetus leucocephalus*), and endangered wood stork (*Mycteria Americana*). Also, the USFWS concurred with the Corps' determination that the proposed action may affect, but is not likely to adversely affect, the endangered American crocodile (*Crocodylus acutus*), the threatened loggerhead sea turtle (*Caretta caretta*), endangered green sea turtle (*Chelonia mydas*), endangered leatherback sea turtle (*Dermochelys coriacea*), endangered hawksbill sea turtle (*Eretmochelys imbricata*), and endangered Kemp's ridley sea turtle (*Lepidochelys kempii*). The Coordination Act Report prepared by the USFWS also stated that

the beach jacquemontia (*Jacquemontia reclinata*) historically occurred on the island.

### 4.2.1 ALTERNATIVE 1, NO ACTION (STATUS QUO)

#### 4.2.1.1 SEA TURTLES

The no action alternative would essentially have no effect on sea turtles. However, removal of exotic vegetation from the coastal strand community may have slightly increased available nesting space.

#### 4.2.1.2 AMERICAN CROCODILE

Clearing of dense exotic vegetation adjacent to existing ponds and construction of a new pond may have increased potential habitat. Otherwise, the no action alternative would have no effect on the American crocodile.

#### 4.2.1.3 WEST INDIAN MANATEE

The no action alternative would have no effect on the manatee.

#### 4.2.1.4 BALD EAGLE

The no action alternative would have no effect on the bald eagle.

#### 4.2.1.5 WOOD STORK

Construction of a new pond would have slightly increased potential feeding habitat for the wood stork. Otherwise, the no action alternative would have no effect on this species.

#### 4.2.1.6 BEACH JACQUEMONTIA

Failure to remove exotic vegetation would most likely result in the continued decline of this species.

## **4.2.2 SELECTED PLAN- ALTERNATIVES 2, 3, AND 4**

### **4.2.2.1 SEA TURTLES**

The Corps is proposing to remove exotic vegetation from the coastal strand community that may be used by, or at least potentially lies in close proximity to, sea turtle nesting areas. Vehicular access to the coastal strand from the island's interior as well as from the beach would facilitate the elimination of exotic trees and shrubs. In order to avoid possible adverse impacts to nesting sea turtles, the Corps has agreed that its contractor will not access the beach to conduct any portion of the coastal strand restoration during the sea turtle nesting season, March 15 through November 30. In addition, no work will be conducted along the beach slope of the coastal strand during this time period.

Removal of exotic vegetation may slightly increase sea turtle nesting habitat.

### **4.2.2.2 AMERICAN CROCODILE**

Exotic vegetation removal is unlikely to adversely affect crocodiles. In order to minimize potential adverse impacts to this species, the contractor would be required to educate construction personnel using posters, videos, pamphlets, lectures, etc. on the following:

1. Identification of the American crocodile, its habits, and protection under federal law;
2. Instructions not to injure, harm, harass or kill this species.

Similar restoration efforts were performed within sight of American crocodiles at Bill Baggs State Park. The animals did not attempt to leave the area or appear to be stressed by the activity (G. Milano, Department of Environmental Resource

Management-Dade County, 2002, personal communication). Removal of dense exotic vegetation adjacent to existing ponds may improve access to these areas for the crocodile.

### **4.2.2.3 WEST INDIAN MANATEE**

The manatee is known to occur in Biscayne Bay. However, no restoration work performed under this alternative is being planned in coastal waters. The ditches and isolated ponds within these project areas are not accessible to the manatee. For this reason, the Corps has determined that the proposed restoration would have no effect on this species.

### **4.2.2.4 BALD EAGLE**

The bald eagle was not observed in these areas during recent site visits and there are no FWC records of eagle nests for the island. The proposed action should have no effect on this species.

### **4.2.2.5 WOOD STORK**

The wood stork may at times utilize aquatic habitats within the study area for feeding purposes. However, Dade County-Department of Environmental Resource Management personnel and Corps biologists have not observed the stork or potential nesting or roosting sites in these locations. This action should essentially have no adverse effect on this species.

### **4.2.2.6 BEACH JACQUEMONTIA**

Exotic vegetation removal may affect the beach jacquemontia. In order to avoid potential adverse impacts to this species, the contractor would be required to educate construction personnel using posters, videos, pamphlets, lectures, etc. on the following:

1. Identification of the beach jacquemontia, its preferred habitat, and protection under federal law;

2. Instructions not to injure or destroy this plant species.

The proposed action should benefit this plant by removing dense exotic vegetation that out competes it.

#### **4.2.3 ALTERNATIVE 2-LOWER KEY RESTORATION**

##### **4.2.3.1 SEA TURTLES**

Exotic vegetation removal would occur within the coastal strand community of the Lower Key area. However, sea turtle nesting density along this section of beach is not nearly as high as along the Middle and Upper Key areas. Therefore, potential adverse effects would be correspondingly much less. Similar efforts of avoidance, as previously mentioned, would be implemented.

##### **4.2.3.2 AMERICAN CROCODILE**

The removal of exotic vegetation would occur along the pond in the Lower Key area. However, it is unlikely that this species occurs in this location since the pond is surrounded by open space and there is more human activity here. Nevertheless, protection measures would be implemented as previously mentioned.

##### **4.2.3.3 WEST INDIAN MANATEE**

No restoration efforts would be performed in coastal waters under this alternative. The interior ponds and remnant channels within these areas are not connected to the coast. This alternative would not affect the manatee.

##### **4.2.3.4 BALD EAGLE**

The bald eagle was not observed in these areas during multiple site visits this past year and there are no records of eagle nests for these locations. The proposed action should have no effect on this species.

##### **4.2.3.5 WOOD STORK**

Dade County-Department of Environmental Resource Management personnel and Corps biologists did not observe the wood stork or potential nesting or roosting sites in these locations. This action should essentially have no effect on this species.

##### **4.2.3.6 BEACH JACQUEMONTIA**

Exotic vegetation removal may affect the beach jacquemontia. In order to avoid potential adverse impacts to this species, the contractor would be required to educate construction personnel using posters, videos, pamphlets, lectures, etc. as previously described. The proposed action should benefit this species by removing dense exotic vegetation that out competes it.

#### **4.2.4 ALTERNATIVE 2-A – LOWER KEY WITH CREATION OF POND WITH WETLAND**

This alternative would have virtually the same effects as those listed for Alternative 2. In addition, creation of the new pond and planting with native vegetation may increase potential habitat for the American Crocodile as well as other wildlife.

#### **4.2.5 ALTERNATIVE 3-MIDDLE KEY**

##### **4.2.5.1 SEA TURTLES**

Exotic vegetation removal would occur within the coastal strand community of the Middle Key area. Sea turtle nesting density along this section of beach is higher than that on the Lower Key beach. In order to avoid possible adverse impacts to nesting sea turtles efforts of avoidance, as previously mentioned, would be implemented.

##### **4.2.5.2 AMERICAN CROCODILE**

Exotic vegetation removal is unlikely to adversely affect crocodiles. In order to

minimize potential adverse impacts to this species protection measures would be implemented as previously mentioned.

#### **4.2.5.3 WEST INDIAN MANATEE**

No restoration efforts would be performed in coastal waters under this alternative. This alternative would not affect the manatee.

#### **4.2.5.4 BALD EAGLE**

The bald eagle was not observed in these areas during multiple site visits this past year and there are no records of eagle nests for these locations. The proposed action should have no effect on this species.

#### **4.2.5.5 WOOD STORK**

Dade County-Department of Environmental Resource Management personnel and Corps biologists did not observe the wood stork or potential nesting or roosting sites in these locations. This action should essentially have no effect on this species.

#### **4.2.5.6 BEACH JACQUEMONTIA**

Exotic vegetation removal may affect the beach jacquemontia. In order to avoid potential adverse impacts to this species, the contractor would be required to educate construction personnel using posters, videos, pamphlets, lectures, etc. as previously described. The proposed action should benefit this species by removing dense exotic vegetation that out competes it.

### **4.2.6 ALTERNATIVE 4- UPPER KEY**

#### **4.2.6.1 SEA TURTLES**

Exotic vegetation removal would occur within the coastal strand community of the Upper Key area. Sea turtle nesting density along this section of beach is higher than that on the Lower Key beach. In order to avoid possible adverse impacts to nesting sea turtles efforts of avoidance, as

previously mentioned, would be implemented.

#### **4.2.6.2 AMERICAN CROCODILE**

The removal of exotic vegetation would occur near a small portion of open water in the Upper Key area. Exotic vegetation removal is unlikely to adversely affect crocodiles. In order to minimize potential adverse impacts to this species protection measures would be implemented as previously mentioned.

#### **4.2.6.3 WEST INDIAN MANATEE**

No restoration efforts would be performed in coastal waters under this alternative. The interior ponds and remnant channels within these areas are not connected to the coast. This alternative would not affect the manatee.

#### **4.2.6.4 BALD EAGLE**

The bald eagle was not observed in these areas during multiple site visits this past year and there are no records of eagle nests for these locations. The proposed action should have no effect on this species.

#### **4.2.6.5 WOOD STORK**

Dade County-Department of Environmental Resource Management personnel and Corps biologists did not observe the wood stork or potential nesting or roosting sites in these locations. This action should essentially have no effect on this species.

#### **4.2.6.6 BEACH JACQUEMONTIA**

Exotic vegetation removal may affect the beach jacquemontia. In order to avoid potential adverse impacts to this species, the contractor would be required to educate construction personnel using posters, videos, pamphlets, lectures, etc. as previously described. The proposed action should benefit this species by removing dense exotic vegetation that out competes it.

### 4.3 VEGETATION

All exotic vegetation would be selectively cut in order to preserve as many of the remaining native plants as possible. In some areas individual exotic plants may be cut with a chain saw or removed by hand. If it were necessary to cut an exotic tree or shrub and leave the stem, the stem would be treated with an appropriate herbicide. Heavy machinery may be used to clear areas where the exotics have become especially dominant.

#### 4.3.1 PROPOSED ACTION, ALTERNATIVES 2, 3, AND 4

##### 4.3.1.1 TROPICAL HARDWOOD HAMMOCK

Native tropical hardwood hammock trees and shrubs would be planted. A total of 6,640 trees and 12,920 shrubs will be planted. See Appendix B for more details. Plantings may include, depending on availability, the following list of native salt tolerant plants:

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
<b>TREES</b>	
Red Bay	<i>Persea borbonia</i>
Pigeon Plum	<i>Coccoloba diversifolia</i>
Wild Tamarind	<i>Lysiloma bahamensis</i>
Gumbo Limbo	<i>Bursea simaruba</i>
Mastic	<i>Mastichodendron foetidissium</i>
Paradise Tree	<i>Simarouba glauca</i>
Black Ironwood	<i>Krugiodendron ferrum</i>
<b>SHRUBS</b>	
Wild Coffee	<i>Psychotria nervosa</i>
Spanish Stopper	<i>Eugenia foetida</i>
Beauty Berry	<i>Callicarpa americana</i>
Joewood	<i>Jacquinai keyensis</i>
Wax myrtle	<i>Myrica cerifera</i>
Snowberry	<i>Chiococca alba</i>
Firebush	<i>Hamelia patens</i>

##### 4.3.1.2 COASTAL STRAND

Indigenous species of coastal strand vegetation would be planted. A total of 16,485 herbaceous plants, and 380 shrubs would be planted. See Appendix B for more detail. These plantings may include, depending on availability, the following list of native salt tolerant plants:

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
<b>HERBACEOUS PLANTS</b>	
Panicum Grass	<i>Panicum amarum</i>
Sea Lavender	<i>Mallotonia gnaphalodes</i>
Beach Morning Glory	<i>Ipomea pes-caprae</i>
Seashore Dropseed	<i>Sporobolus virginicus</i>
Beach Bean	<i>Canavalia maritima</i>
Blanket Flower	<i>Gaillardia pulchella</i>
Dune Sunflower	<i>Helianthus debilis</i>
<b>WOODY PLANTS</b>	
Inkberry	<i>Scaevola plumieri</i>
Saw Palmetto	<i>Serenoa repens</i>
Yaupon Holly	<i>Ilex vomitoria</i>
Cocoplum	<i>Chrysobalanus uvifera</i>
Sea Grape	<i>Coccoloba uvifera</i>

##### 4.3.1.3 POND WITH WETLANDS

All existing jurisdictional wetlands should be clearly marked prior to restoration activities. It is recommended that exotic vegetation from these areas be removed by hand. A Section 404 (B) (see Appendix 1) evaluation has been performed in the event that heavy equipment was to be used within wetland areas. Regardless of the removal method utilized, all debris would be placed in an appropriate landfill or mulched.

Approximately 110 trees, 150 shrubs, and 200 plants would be placed within the pond with wetlands area. See Appendix B for



more detail. These plants, depending on availability, may include the following:

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Duck Potato	<i>Sagittaria lancifolia</i>
Lemon Bacopa	<i>Bacopa caroliniana</i>
Slender Cordgrass	<i>Spartina bakerii</i>
False Foxglove	<i>Agalinia linifolia</i>
Pickereelweed	<i>Pontederia cordata</i>
Marsh Mallow	<i>Sebatia grandifolia</i>
Spikerush	<i>Eleocharis flacida</i>

#### 4.3.1.4 WETLANDS

Approximately 585 trees, 1,315 shrubs, and 2,310 herbaceous plants are proposed to be planted throughout the tidally effected wetland area. See Appendix B for more detail. These plants, depending on availability, may include the following:

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Black Mangrove	<i>Avicennia germinans</i>
Gulf Cordgrass	<i>Spartina spartinae</i>
Myrsine	<i>Myrsine guianensis</i>
Palmetto	<i>Sabal palmetto</i>

#### 4.3.2 ALTERNATIVE COMPARISON

The types of native vegetation and the planting methodology would be similar for each of the proposed alternatives.

### 4.4 FISH AND WILDLIFE RESOURCES

#### 4.4.1 PROPOSED ACTION, ALTERNATIVE 2, 3, AND 4

Alternative 2, 3, and 4, would provide the greatest long-term benefit to those species dependent on native plant communities. It would restore, to the greatest extent, native ecosystem structure and function. A total of 34.9 acres of tropical hardwood hammock and 13.7 acres of dune/coastal strand habitat would be restored. 7.3 acres of tidally influenced wetlands and 3.2 acres of pond with wetland habitat would be

restored. There would be a short-term disturbance to resident wildlife caused by the restoration activities.

#### 4.4.2 ALTERNATIVE 2-LOWER KEY

This alternative would also provide a long-term benefit to those species dependent on native plant communities. A total of 24.2 acres of tropical hardwood hammock, 8.2 acres of dune/coastal strand habitat, 0.7 acres of wetlands and 3.2 acres of pond with wetlands habitat would be restored. There would be a short-term disturbance to resident wildlife caused by the restoration activities.

#### 4.4.3 ALTERNATIVE 2-A -LOWER KEY WITH CREATED POND WITH WETLANDS

Alternative 2-A would also provide a long-term benefit to those species dependent on native plant communities. A total of 22.1 acres of tropical hardwood hammock, 8.2 acres of dune/coastal strand habitat, 0.7 acres of wetland, and 3.2 acres of pond with wetland habitat would be restored. Construction of additional pond with wetlands habitat, 2.1-acres, would create additional aquatic habitat. There would be a short-term disturbance to resident wildlife caused by the restoration activities.

#### 4.4.4 ALTERNATIVE 3 -MIDDLE KEY WITH POND

Alternative 3 would also provide a benefit to those species dependent on native plant communities. A total of 9.2 acres of tropical hardwood hammock, 3.4 acres of dune/coastal strand habitat, and 6.6 acres of wetland would be restored. There would be a short-term disturbance to resident wildlife caused by the restoration activities.

#### **4.4.5 ALTERNATIVE 4 –UPPER KEY WITH POND**

Alternative 4 would provide a benefit, though for a smaller area, to those species dependent on native plant communities. A total of 1.5 acres of tropical hardwood hammock and 2.1 acres of dune/coastal strand habitat would be restored. There would be a short-term disturbance to resident wildlife caused by the restoration activities.

#### **4.4.6 ALTERNATIVE 1, NO ACTION (STATUS QUO)**

There would be a long-term adverse impact to those species dependent on native plant communities if the no action alternative were selected.

#### **4.5 WATER QUALITY**

In general, adverse effects to water quality are not anticipated since no work is being proposed in the water and no material is to be placed on the beach for any of the previously described alternatives.

#### **4.6 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE**

The preliminary assessment indicated that no hazardous, toxic, radioactive (HTRW), or other harmful substances are impacting the project area. However, if contaminants are found during construction, the site must be remediated.

#### **4.7 SOCIO-ECONOMIC**

All of the alternatives described for this project, coupled with the Section 111 shoreline protection project and the planned improvements of the Virginia Key Park Civil Rights Task Force, should increase the appeal of the existing park to potential tourists. In addition, it would provide increased educational opportunities for Miami-Dade County residents as well as non-residents.

#### **4.8 CULTURAL RESOURCES**

An archival review and cultural resources surveys have been conducted to locate and identify any significant prehistoric or historic properties within the area of potential effect for the proposed shore stabilization project. The Virginia Key Beach Park is the only historic property currently identified within the area of potential effects. The park has been nominated for inclusion in the National Register of Historic Places. The project may have an effect on the Virginia Key Park, however, this effect will either be beneficial or neutral. In either case the effect will not be adverse. Consultation with the State Historic Preservation Officer will be completed prior to construction.

#### **4.9 RECREATION**

A multi-purpose trail is being planned throughout a large portion of the restoration area. The trail would be 8-feet wide with a crushed shell substrate. It would serve primarily as a maintenance access route but could also be used for recreation. A limited number of benches and interpretive signs are also being planned. The footprint of trail would have a minor impact on existing vegetation.

#### **4.10 AESTHETICS**

The removal of exotic vegetation and the planting of native vegetation would improve the aesthetic quality of the park. The presence of machinery and personnel conducting restoration activities would create a short-term disturbance.

#### **4.11 CUMULATIVE IMPACTS**

Cumulative impact is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). This restoration

project, in combination with similar efforts, as mentioned in Section 1.5 of this report, would benefit fish and wildlife resources.

#### **4.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

##### **4.12.1 IRREVERSIBLE**

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment might be the mining of a mineral resource. The proposed project would enhance fish and wildlife resources. The only irreversible commitment of resources would be the use of federal funds to perform the restoration action.

##### **4.12.2 IRRETRIEVABLE**

An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction. During the restoration effort, there would be a temporary disturbance of vegetation.

#### **4.13 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS**

Removal of exotic vegetation would undoubtedly result in the loss of some native plants, but they would be replanted with nursery stock.

#### **4.14 LOCAL SHORT-TERM USES AND MAINTENANCE/ENHANCEMENT OF LONG-TERM PRODUCTIVITY**

The project would require initial funding to accomplish the restoration. Maintenance funding, the responsibility of local sponsor, would also be required. In the long run, fish

and wildlife habitat would benefit from this project.

#### **4.15 INDIRECT EFFECTS**

Additional visitors to the park should be expected. Efforts such as these could result in additional interest in restoration projects.

#### **4.16 COMPATIBILITY WITH FEDERAL, STATE, AND LOCAL OBJECTIVES**

The proposed restoration project would not be contrary to federal, state, or local objectives and land use planning.

#### **4.17 CONFLICTS AND CONTROVERSY**

There are no controversial aspects associated with this project.

#### **4.18 UNCERTAIN, UNIQUE, OR UNKNOWN RISKS**

The Corps has identified only minimal uncertain, unique, or unknown risks. With the proposed environmental commitments, risk to the environment is minimal.

#### **4.19 PRECEDENT AND PRINCIPLE FOR FUTURE ACTIONS**

The proposed project is not anticipated to set a negative precedent for future actions; rather a positive influence is anticipated.

#### **4.20 ENVIRONMENTAL COMMITMENTS**

The U.S. Army Corps of Engineers and contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

1. The contractor would comply with all terms and conditions set out in the Biological Opinion of the U.S. Fish and Wildlife Service for those federally

endangered or threatened species identified in this Environmental Assessment.

Specifically, protection measures would be implemented to avoid or minimize adverse impacts to sea turtles, American crocodiles, and the beach jacquemontia. In addition, the standard migratory bird protection measures would also be implemented.

2. It is recommended that the existing jurisdictional wetlands be clearly marked prior to performing any restoration activities.

3. The contractor would establish and maintain quality control for environmental protection of all items set forth in the project plans and specifications. The contractor would record on daily quality control reports or attachments thereto, any problems in complying with laws, regulations and ordinances, and corrective action taken.

4. The contracting officer would notify the contractor in writing of any observed noncompliance with federal, state, or local laws or regulations, permits and other elements of the contractor's Environmental Protection Plan. The contractor would, after receipt of such notice, inform the contracting officer of proposed corrective action and take such action as may be approved. If the contractor fails to comply promptly, the contracting officer would issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions would be granted or costs or damages allowed to the contractor for any such suspension.

5. The contractor would train his personnel in all phases of environmental protection. The training would include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities to insure adequate and continuous environmental pollution control. Quality control and supervisory personnel would be thoroughly trained in the proper

use of monitoring devices and abatement equipment, and would be thoroughly knowledgeable of federal, state, and local laws, regulations, and permits as listed in the Environmental Protection Plan submitted by the contractor.

6. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract would be protected during the entire period of this contract. The contractor would confine his activities to areas defined by the drawings and specifications.

7. As stated in the standard contract specifications, the disposal of hazardous or solid wastes would be in compliance with federal, state, and local laws. A spill prevention plan would also be required.

8. Terms and conditions would be included in contract specifications to ensure that the contractor would remove only exotic vegetation and avoid impacts to native plants.

#### **4.21 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS**

##### **4.21.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969**

Environmental information on the project has been compiled and this draft Environmental Assessment has been prepared. The project will be in full compliance with the National Environmental Policy Act upon completion of the final Environmental Assessment.

##### **4.21.2 ENDANGERED SPECIES ACT OF 1973**

Consultation was initiated with the USFWS on 15 February 2002 and completed on 6 August 2002. This project was fully coordinated under the Endangered Species

Act and is therefore, in full compliance with the Act.

#### **4.21.3 FISH AND WILDLIFE COORDINATION ACT OF 1958**

This project has been coordinated with the USFWS. A final Coordination Act Report (CAR) was completed on 6 August 2002. This project is in full compliance with the Act.

#### **4.21.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)**

Archival research, fieldwork, and consultation with the State Historic Preservation Officer (SHPO) is being conducted in accordance with the National Historic Preservation Act, as amended. The project will be in compliance with the Act.

#### **4.21.5 CLEAN WATER ACT OF 1972**

The Corps has coordinated this project with the State of Florida, pursuant to Section 401 of the Clean Water Act. All State water quality standards would be met. A Section 404(b) evaluation has been completed in the event that the soil within wetland areas is disturbed. This project will be in full compliance with the Act prior to commencement of the proposed work.

#### **4.21.6 CLEAN AIR ACT OF 1972**

No air quality permits would be required for this project.

#### **4.21.7 COASTAL ZONE MANAGEMENT ACT OF 1972**

State consistency review will be performed during the coordination of the draft EA. The Corps' consistency determination can be

found in Appendix 1). This project will be in full compliance with the Act prior to commencement of the proposed work.

#### **4.21.8 FARMLAND PROTECTION POLICY ACT OF 1981**

No prime or unique farmland would be impacted by implementation of this project. This Act is not applicable.

#### **4.21.9 WILD AND SCENIC RIVER ACT OF 1968**

No designated Wild and Scenic river reaches would be affected by project related activities. This Act is not applicable.

#### **4.21.10 MARINE MAMMAL PROTECTION ACT OF 1972**

No work is proposed in areas where marine mammals may be encountered, therefore, this Act is not applicable.

#### **4.21.11 ESTUARY PROTECTION ACT OF 1968**

No designated estuary would be affected by project activities. This act is not applicable.

#### **4.21.12 FEDERAL WATER PROJECT RECREATION ACT**

The principles of the Federal Water Project Recreation Act, (Public Law 89-72) do not apply to this project.

#### **4.21.13 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976**

No fishery resource subject to this Act would be affected.



#### **4.21.14 SUBMERGED LANDS ACT OF 1953**

No submerged lands would be affected by the project. Therefore, this Act does not apply.

#### **4.21.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990**

Although it is not a coastal barrier resource, Virginia Key does fall within a "protected area." These Acts are not applicable.

#### **4.21.16 RIVERS AND HARBORS ACT OF 1899**

The proposed work would not obstruct navigable waters of the United States. The proposed action will be subject to a public notice, possible public hearing, and other evaluations normally conducted for activities subject to the Act. The project will be in full compliance.

#### **4.21.17 ANADROMOUS FISH CONSERVATION ACT**

Anadromous fish species would not be affected. This Act is not applicable.

#### **4.21.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT**

No migratory birds would be adversely affected by project activities. The project is in compliance with these Acts.

#### **4.21.19 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT**

The term "dumping" as defined in the Act (33 U.S.C. 1402)(f) does not apply to the

disposal of material for beach nourishment or to the placement of material for a purpose other than disposal (i.e. placement of rock material as an artificial reef or the construction of artificial reefs as mitigation). Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project.

#### **4.21.20 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT**

No Essential Fish Habitat (EFH) would be affected by this project. This Act does not apply.

#### **4.21.21 E.O. 11990, PROTECTION OF WETLANDS**

The wetlands within the project area are considered jurisdictional and a Section 404 (B) analysis has been performed (see Appendix A). This project is in compliance with the goals of this Executive Order.

#### **4.21.22 E.O. 11988, FLOOD PLAIN MANAGEMENT**

The project is in the base flood plain and has been evaluated in accordance with this Executive Order. Project is in compliance.

#### **4.21.23 E.O. 12898, ENVIRONMENTAL JUSTICE**

The proposed project would not result in adverse human health or environmental effects. Any impacts of the action would not be disproportionate towards any minority. The activity does not (a) exclude persons from participation in, (b) deny persons the benefits of, or (c) subject persons to discrimination because of their race, color, or national origin. The activity would not impact "subsistence consumption of fish and wildlife."

**4.21.24 E.O. 13089, CORAL REEF  
PROTECTION**

**No coral reef or coral reef organism would  
be impacted by this project.**

**4.21.25 E.O. 13112, INVASIVE  
SPECIES**

**The proposed restoration action would  
involve the removal of exotic species of  
plants and restore native vegetation and  
habitat conditions.**

## **5 LIST OF PREPARERS**

### **5.1 PREPARERS**

<b>Paul Stodola</b>	<b>Biologist</b>	<b>Principal Author</b>
<b>Paul Stevenson</b>	<b>Landscape Architect</b>	<b>Landscape Plan</b>
<b>Grady Caulk</b>	<b>Archaeologist</b>	<b>Cultural Resources</b>
<b>Thomas Martin</b>	<b>Engineer</b>	<b>Pond Design</b>
<b>Peter Besrutschko</b>	<b>Engineer</b>	<b>HTRW</b>

### **5.2 REVIEWERS**

Mr. James McAdams, supervisor, Atlantic Coast Section, reviewed this draft Environmental Assessment. It was also evaluated during the Internal Technical Review process established by the District.

## **6 PUBLIC INVOLVEMENT**

### **6.1 SCOPING AND DRAFT EA**

A scoping letter dated July 24, 2000, was issued during the reconnaissance phase for this action. Copies of the preliminary Finding of No Significant Impact and draft Environmental Assessment will be issued to the appropriate federal, state, and local agencies, appropriate city and county officials, and other parties known to be interested in the project. The scoping letter, mailing list, and letters of response were included in Appendix G, Pertinent Correspondence.

### **6.2 AGENCY COORDINATION**

The proposed project has been coordinated with the U.S. Fish and Wildlife Service, Florida Department of Environmental Protection, Florida State Historic Preservation Officer, Florida State Clearinghouse, and other agencies.

### **6.3 COMMENTS RECEIVED AND RESPONSE**

Comments and other information received were considered in the writing of this draft EA. Responses to recommendations from the U.S. Fish and Wildlife Service (see Coordination Act Report in the EA Appendix 3) are as follows:

**Comment 1:** Beach access to restoration areas by vehicles or heavy equipment should occur outside the sea turtle nesting season between March 15 and November 30.

**Response:** Concur, refer to Section 4.2.

**Comment 2:** Recreational amenities or increased human access to the existing natural areas provided by the restoration project or the adjacent Park restoration, should be compatible with the project's

primary purpose of environmental enhancement. Environmental planning and public education efforts should occur to help minimize harmful human interactions with threatened and endangered species and other fish and wildlife resources.

**Response:** Environmental planning and public education efforts as mentioned above have been discussed with the local sponsor who is responsible for the management of the areas in question.

**Comment 3:** A comprehensive post-project monitoring plan should be included in the project plans. The monitoring plan should include periodic vegetation surveys and should evaluate the hydrology of proposed wetlands and ponds. Reports should be submitted to the Corps and the Service and include photo documentation (digital preferred) describing the status of restoration efforts, including exotic vegetation status, native planting status, and fish and wildlife survey data.

**Response:** The local sponsor has expressed their commitment to keep exotic vegetation out of the restoration areas. All other aspects of managing the property would be the responsibility of the local sponsor.

**Comment 4:** Project plans should stipulate that a qualified person(s), knowledgeable in local upland and wetland botany and coastal restoration, be present during land clearing to ensure minimal damage to native species. This person(s) should also direct selection and planting of native species, as well as any tidal tributary and wetland pond excavation.

**Response:** The Corps intends to request the assistance of Dade County-DERM during the restoration.

**Comment 5:** A beach jacquemontia reestablishment program should be

considered. Efforts to reintroduce the beach jacquemontia at nearby Crandon Park can provide relevant information and experience in planting this species on Virginia Key.

Response: The Corps has discussed this idea with the local sponsor and Dade County-DERM.

Comment 6: A crocodile management and monitoring plan should be developed for Virginia Key.

Response: This species may occur on Virginia Key but its presence has never been confirmed. Educational signs on crocodiles have been discussed with the local sponsor and Dade County-DERM.



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## **APPENDIX 1 - SECTION 404(B) EVALUATION**

## **SECTION 404(b) EVALUATION**

### **SECTION 1135 ECOSYSTEM RESTORATION VIRGINIA KEY DADE COUNTY, FLORIDA**

#### **I. Project Description**

a. Location. The proposed environmental restoration would occur within selected areas of Virginia Key Beach Park, Dade County, Florida.

b. General Description. Project features would include the removal of exotic vegetation from disturbed habitat. Indigenous species of trees, shrubs and herbaceous vegetation would be planted in the larger areas where the dominant exotics had been eliminated. Scattered throughout the restoration area are water-filled ditches and fresh or brackish-water ponds. A multi-purpose trail is also being planned in order to provide access throughout a portion of the park.

c. Authority and Purpose. Section 1135 of the Water Resources Development Act of 1986 (WRDA 86), Public Law 99-662, as amended, authorizes the U.S. Army Corps of Engineers (Corps) to make modifications in its water resources projects, if determined that the modifications are: (1) feasible and consistent with the authorized project purposes, and (2) will improve the quality of the environment in the public interest. The primary benefits from Section 1135 modifications must be associated with improvements to fish and wildlife resources. Projects constructed by the Corps on Virginia Key and related to the proposed action include: a 66-acre dredged material management area along the island's northern terminus which continues to be used for federal navigation improvements, and; the placement of beach quality sand and groins along 1.8 miles of the seaward shoreline for shore protection. The Virginia Key Beach Park lies adjacent to these project areas.

d. General Description of Dredged or Fill Material. Heavy equipment may be utilized to clear exotic vegetation from wetland areas. Such mechanized land clearing would result in redeposition of soil that is considered fill and subject to regulation under Section 404 of the Clean Water Act.

(1) General Characteristics of Material. Primarily exotic vegetation and some soil.

(2) Quantity of Material. Undetermined.

(3) Source of Material. Jurisdictional wetlands found within restoration area.

e. Description of the proposed Discharge Site.

(1) Location. Jurisdictional wetlands found within restoration area. The redeposition of soil within jurisdictional wetlands constitutes a discharge. However, all debris resulting from the clearing of exotic vegetation would be removed from the wetlands and placed in an appropriate landfill or mulched and used in upland areas.

(2) Size. The wetlands have not been surveyed, therefore the size is not known.

(3) Type of Site. Jurisdictional wetlands.

(4) Type of Habitat. The ponds have open-water with a hydric vegetation fringe and are fresh-brackish water environments. The ditches were constructed to control mosquitoes and occasionally hold water. None of these areas are connected to any other water body except perhaps to the ocean during storm surge.

(5) Timing and Duration of Discharge. Undetermined, but the clearing of exotic vegetation within these wetland areas is expected to be accomplished within a matter of days.

f. Description of Disposal Method. Redeposition of soil due to use of heavy equipment. However, all debris would be removed from the wetlands with heavy equipment and placed in an appropriate landfill or mulched.

## II. Factual Determinations

### a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. Undetermined, estimated at slightly above or at sea level.

(2) Sediment Type. Sediment within the wetland areas are expected to consist of muck soils.

(3) Dredge/Fill Material Movement. Fill material, vegetation and as little soil as possible would be removed as stated earlier. Wetland areas would be stabilized with the planting of native vegetation.

(4) Physical Effects on Benthos. Benthic organisms would be temporarily impacted by redeposition of soil. Recolonization should occur fairly rapidly, within one year.

### b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. Adverse effects to the water column are not anticipated.



(2) Current Patterns and Circulation. Storm surge may sweep through these areas. Project operations would not affect this process.

(3) Normal Water Level Fluctuations and Salinity Gradients. Project operations would not affect normal tide fluctuations or salinity.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. No change is anticipated.

(2) Effects on the Chemical and Physical Properties of the Water Column.

(a) Light Penetration. No adverse impact is anticipated.

(b) Dissolved Oxygen. Dissolved oxygen levels would not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No known sources of toxic metals, organics, and pathogens occur within the project area.

(d) Aesthetics. Aesthetic quality would be reduced during construction activities, however the environment should improve significantly with the eradication of exotic vegetation and planting of native species.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. Impacts to primary productivity would decrease with eradication of exotic vegetation but would be replaced with the planting of native species.

(b) Suspension/Filter Feeders. No adverse impacts are anticipated.

(c) Sight Feeders. No adverse impacts are anticipated.

d. Contaminant Determinations.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. No adverse impacts are anticipated.

(2) Effects on Benthos. No adverse impacts are anticipated.

(3) Effects on Nekton. No adverse impacts are anticipated.

(4) Effects on the Aquatic Food Web. No adverse impacts are anticipated.

(5) Effects on Special Aquatic Sites.

(a) Hardground and Coral Reef Communities. Hardground and coral reef communities do not exist within the project area.

(b) Sanctuaries and Refuges. No sanctuaries or refuges would be impacted by the proposed project.

(c) Wetlands. Construction may temporarily impact wetlands through the removal of exotic vegetation. Wetland functions should improve with the planting of diverse native species.

(d) Mud Flats. No mud flats would be impacted by this project.

(e) Vegetated Shallows. Exotic vegetation within shallow areas of the ponds and/or ditches would be removed.

(f) Riffle and Pool Complexes. No riffle and pool complexes would be impacted by this project.

(6) Endangered and Threatened Species. This project should not adversely affect any listed species, rather habitat should be enhanced.

(7) Other Wildlife. Project impacts to other wildlife in the construction area are expected to be temporary.

(8) Actions to Minimize Impacts. All practicable actions to minimize adverse impacts to natural resources that are found in the proposed restoration area will be included in the project plans and specifications.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. Not applicable.

(2) Determination of Compliance with Applicable Water Quality Standards.  
Not applicable.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. No effects are anticipated.

(b) Recreational and Commercial Fisheries. No effects are anticipated.

(c) Water Related Recreation. Restoration activities would temporarily disrupt recreational opportunities.

(d) Aesthetics. Restoration activities would temporarily adversely impact the aesthetics of the area.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The restoration would occur within the Virginia Key Beach Park owned by the City of Miami.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. This restoration would enhance the aquatic ecosystem of Virginia Key through the eradication of exotic vegetation.

h. Determination of Secondary Effects on the Aquatic Ecosystem. Secondary effects that will adversely impact the aquatic ecosystem as a result of restoration activities are not anticipated.

### III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

- a. No significant adaptations of the guidelines were made relative to this evaluation.
- b. Heavy equipment may be utilized as previously described, but efforts to accomplish the project goals utilizing hand held equipment are recommended.
- c. After consideration of placement/disposal site dilution and dispersion, the discharge of fill materials would not cause or contribute to, violations of any applicable state water quality standards for Class III waters. The discharge operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- d. The proposed project would not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended. Coordination with the U.S. Fish and Wildlife Service is complete.
- e. The placement of fill material would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife would not be adversely affected. Significant adverse effects on aquatic ecosystem diversity,

productivity and stability, and recreational, aesthetic, and economic values would not occur.

f. On the basis of the guidelines, the proposed placement/disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.

## **APPENDIX 2 - COASTAL ZONE MANAGEMENT CONSISTENCY**



**FLORIDA COASTAL ZONE MANAGEMENT PROGRAM  
FEDERAL CONSISTENCY EVALUATION PROCEDURES**

**SECTION 1135  
ECOSYSTEM RESTORATION  
VIRGINIA KEY  
DADE COUNTY, FLORIDA**

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed plans and information will be voluntarily submitted to the state in compliance with this chapter.

2. Chapters 163(part II), 186, and 187, County, Municipal, State and Regional Planning. These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the State's future. Its purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project is being coordinated with various federal, state and local agencies during the planning process. The proposed project would provide for ecosystem restoration.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve

the lives and property of the people of Florida.

Response: The proposed project would have little or no impact on disaster preparation, response or mitigation.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed project would provide for ecosystem restoration on property owned by the City of Miami. The proposed project would comply with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the affected property already is in public ownership, this chapter does not apply.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly

or indirectly adversely impact park property, natural resources, park programs, management or operations.

**Response:** The proposed project area does not contain any state parks or aquatic preserves nor are there any within the immediate vicinity of the project that would be affected. The project is consistent with this chapter.

**7. Chapter 267, Historic Preservation.** This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

**Response:** This project is being coordinated with the State Historic Preservation Officer (SHPO). Historic Property investigations are being conducted in the project area. An archival and literature search of the proposed project area was conducted. The project will be consistent with the goals of this chapter.

**8. Chapter 288, Economic Development and Tourism.** This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

**Response:** The proposed restoration would enhance recreational opportunities. This would be compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

**9. Chapters 334 and 339, Transportation.** This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

**Response:** No public transportation systems would be impacted by this project.

**10. Chapter 370, Saltwater Living Resources.** This chapter directs the state to preserve, manage and protect the

marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

**Response:** The proposed action would not adversely impact saltwater living resources. The project is consistent with the goals of this chapter.

**11. Chapter 372, Living Land and Freshwater Resources.** This chapter establishes the Game and Freshwater Fish Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

**Response:** The project will enhance freshwater aquatic life and wild animal life.

**12. Chapter 373, Water Resources.** This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

**Response:** This project does not involve water resources as described by this chapter.

**13. Chapter 376, Pollutant Spill Prevention and Control.** This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

**Response:** The contract specifications will prohibit the contractor from dumping oil,

fuel, or hazardous wastes in the work area and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan will be required.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed restoration project will not have any regional impact on resources in the area. Therefore, the project is consistent with the goals of this chapter.

16. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project will not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: A draft Environmental Assessment addressing project impacts has been prepared and will be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. The project complies with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands; therefore, this chapter does not apply.



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Florida Ecological Services Office  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960



August 6, 2002

James C. Duck  
Chief, Planning Division  
U.S. Army Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

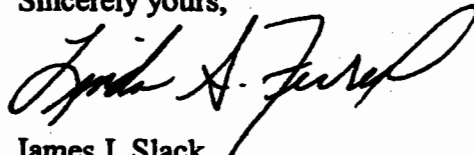
Dear Mr. Duck:

In accordance with the Fiscal Year 2001 Transfer Fund Agreement between the Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers Jacksonville District, attached is the Final Fish and Wildlife Coordination Act (FWCA) Report on the Virginia Key Environmental Restoration project, Miami-Dade County, Florida. This report, provided in accordance with the FWCA, as amended (48 Stat.401; 16 U.S.C. 661 *et seq.*) and under the provisions of section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C., 1531 *et seq.*) (ESA), has been prepared to provide an evaluation of environmental effects on restoration of approximately 94.4 acres on Virginia Key.

Comments on the Draft FWCA Report were received from the National Marine Fisheries Service, and their June 22, 2002, correspondence has been included as an appendix to this report. This Final FWCA Report constitutes the Secretary of the Interior's views and recommendations for this project, in accordance with section 2(b) of the FWCA.

Please contact Andrew Gude at (305) 872-5563, regarding the findings and recommendations contained in this final report.

Sincerely yours,

  
James J. Slack  
Field Supervisor  
South Florida Ecological Services Office

Enclosure

James C. Duck  
August 6, 2002  
Page 2

cc:  
FWC, Vero Beach, FL  
NMFS, Miami, FL  
Miami-Dade County DERM, Miami, FL



**FINAL**

**FISH AND WILDLIFE COORDINATION ACT REPORT**

**VIRGINIA KEY SECTION 1135 ENVIRONMENTAL  
RESTORATION PROJECT**

**MIAMI-DADE COUNTY**



**U.S. Fish and Wildlife Service  
South Florida Ecological Services Office  
Vero Beach, Florida**

**August 6, 2002**

## TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION .....	3
II. DESCRIPTION OF STUDY AREA .....	3
III. PROJECT DESCRIPTION .....	4
IV. FISH AND WILDLIFE RESOURCES .....	6
V. THREATENED AND ENDANGERED SPECIES .....	8
VI. DISCUSSION .....	11
VII. RECOMMENDATIONS .....	12
REFERENCES .....	13

### FIGURES

Figure 1: Study Area

Figure 2: Virginia Key Restoration Concept Plan

### APPENDIX

National Marine Fisheries Service correspondence, June 22, 2002

## INTRODUCTION

Project authority for the environmental restoration of Virginia Key is provided by section 1135 of the Water Resources Development Act of 1986, as amended. This authority gives the U.S. Army Corps of Engineers (Corps) the ability to modify structures and operations of water resource projects, constructed by the Corps, assuming the modifications: (1) are feasible and consistent with the authorized project purposes, and (2) will improve the quality of the environment in the public interest. The primary benefits from section 1135 projects are generally associated with improvements to fish and wildlife resources. In this case, 50 to 100 acres of Virginia Key were previously impacted when used for a dredged material disposal site during federal improvements to the Port of Miami (Corps 2002).

In partnership with the Corps, the project sponsor is the City of Miami. Technical assistance was provided, at the Corps' request, by the U.S. Fish and Wildlife Service (Service) by letter dated November 7, 2000. Fish and wildlife resources, including federally listed threatened and endangered species, were identified and discussed in this letter. A Biological Assessment was submitted by the Corps to the Service on February 15, 2002. The project is tentatively scheduled to begin in the Fall of 2002.

The Service has evaluated the project site and proposed project alternatives. The purpose of this final Fish and Wildlife Coordination Act (FWCA) report is to assess the effects of the project's restoration efforts on existing and potential fish and wildlife resources, including threatened and endangered species. This report is submitted in accordance with the Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*) (FWCA) and section 7 of the Endangered Species Act of 1973, as amended; (16 U.S.C. 1531 *et seq.*) (ESA).

## DESCRIPTION OF STUDY AREA

Biscayne Bay, located on Florida's southeast coast extending from Miami-Dade County south to Monroe County, is a shallow, clear water, subtropical, estuary-lagoon system supporting a wide variety of fish and wildlife resources. Representative ecological communities include terrestrial, coastal and estuarine wetlands, mangrove, seagrasses, stony corals, hardbottom soft coral and sponge, and other mixed benthic habitats. North Biscayne Bay, adjacent to the project area, has been severely affected by development, including six filled causeways and a seaport facility. Low coastal wetlands in the Miami area have been virtually eliminated and over 40 percent of bay bottom communities have been altered by spoil emplacement and dredging.

Virginia Key is a natural barrier island located along eastern Biscayne Bay on the Atlantic coast of Miami-Dade County, Florida. The Key is just east of mainland urban Miami in the vicinity of Coconut Grove, south of Miami Beach, Fisher Island, and north of Key Biscayne, and it is connected to the Florida Peninsula by the Rickenbacker Causeway (Figure 1). Prior to the creation of Government Cut, it was contiguous to Miami Beach (Dade County Department of Environmental Resource Management (DERM), 1999). Beginning in the late 1940s through the

1980s, significant dredge and fill projects transformed Virginia Key, including the construction of Rickenbacker Causeway, the dredging of the Miami Marine Stadium basin, and Fisherman's Channel. Many areas of the island have been cleared of native vegetation for human uses such as the marine stadium, a sewage treatment facility, a municipal landfill, parking lots for these uses, as well as docks and buildings for several restaurants, marinas, and commercial fishing operations. Also located on Virginia Key is the Miami Seaquarium, the University of Miami Marine Laboratory, and a 32.0-acre City park. There is a Florida State-designated Critical Wildlife Area, created primarily for the West Indian manatee and wading bird protection, located at the northwest side of the island, opposite the project site. Currently 77.0 acres of the City park are under consideration for designation as a National Historic Area. The proposed 94.4-acre restoration of Virginia Key would occur within a portion of the park (Figure 2). The environmental restoration would be performed in concert with the development of historic Virginia Key Beach Park, which is important to local entities protecting and restoring both historic and environmental characteristics of the island. The restoration efforts will enhance local fish and wildlife resources by restoring biologically diverse habitat types that have declined in the greater Miami area.

## PROJECT DESCRIPTION

The overall restoration goal for this project is to restore and enhance a total of approximately 94.4 acres of upland and wetland habitat adjacent to and within the 132.0-acre city park on Virginia Key. In addition, but indirectly related to this 1135 project, the City of Miami is planning on restoring the historical, cultural, educational, and recreational components of Virginia Key Beach Park (City of Miami Virginia Key Park Civil Rights Task Force, 2000). Tentatively scheduled to begin in the Fall of 2002, the environmental restoration of selected areas on the island would be accomplished by removing exotic vegetation from approximately 83.1 acres of tropical hardwood hammock. Scattered throughout several of these hammock areas are isolated depressional wetlands and fresh/brackish-water ponds. Exotic vegetation would also be removed from an estimated 6.9 acres of coastal strand and 2.4 acres of a fairly distinctive interior wetland. A 2.0-acre freshwater pond with a wetland fringe is also planned for construction. All exotics will be selectively cut in order to preserve as much of the remaining native vegetation as possible. However, heavy machinery may be used to clear those parts of the island where exotic vegetation has become dominant. Native vegetation would be planted throughout much of the restoration area where exotics have been eliminated. Vehicles and heavy equipment used to remove exotic vegetation will work, for the most part, from the island's interior to avoid impacting the beach. However, in certain areas along the coastal strand, the depressional wetlands allow access to the coastal strand vegetation difficult from the interior of the island.

The Corps' Preferred Alternative for each specific restoration area is as follows (Figure 2):

**Area 1.** Coastal Strand Community; 3.1 acres

- remove exotic plant species such as Australian pine, inkberry, and Brazilian pepper
- plant native coastal strand species

**Area 1A.** Open Space, Pond, remnant Tropical Hardwood Hammock; 39.6 acres

- remove Brazilian pepper and Australian pine
- plant native tropical hardwood species on 18.0 acres
- open space would remain for parking, but maybe landscaped in some open areas with native vegetation

**Area 2.** Tropical Hardwood Hammock, Wetland Areas, Open Space; 30.8 acres

- remove exotics including Australian pine and Brazilian pepper on 22.6 acres
- plant native tropical hardwood species
- open area would remain for parking and recreation, but maybe landscaped with native vegetation to a limited extent

**Area 2A.** Freshwater Pond with Fringe Wetland; 2.1 acres

- construct a freshwater wetland with a 10:1 bank slope and a maximum excavation depth of 0.0 feet at mean sea level. Hydric vegetation is expected to colonize the perimeter of the pond
- remove construction debris, primarily rock and fill material

**Area 3.** Tropical Hardwood Hammock; 9.0 acres

- remove exotics such as Australian pine, seaside mahoe, and Brazilian pepper
- plant native tropical hardwood species

**Area 4.** Coastal Strand Community; 3.8 acres

- remove exotics such as Australian pine, inkberry, and Brazilian pepper
- plant native coastal strand species

**Area 5.** Wetland Area; 2.4 acres

- remove exotics and plant native vegetation

**Area 6.** Tropical Hardwood Hammock; 19.9 acres

- remove remaining exotics
- plant additional native species to supplement the plantings that have already occurred
- 

**Area 7.** Tropical Hardwood Hammock; 11.4 acres

- remove exotics such as Brazilian pepper and Australian pine
- plant with native hardwood hammock species



- Area 8. Tropical Hardwood Hammock; 0.8 acres
- remove exotic vegetation

- Area 9. Tropical Hardwood Hammock; 2.2 acres
- remove exotic vegetation

## FISH AND WILDLIFE RESOURCES

On June 8, 2002, Service staff inspected the restoration site on Virginia Key with Paul Stodola with the Corps, Gary Milano with the DERM, and Wendy Teas with the National Marine Fisheries Service (NMFS). Existing conditions of vegetative communities, based on field observations, literature, and information supplied by the Corps and DERM, are as follows:

Area 1. and Area 4. Coastal Strand Community; 6.9 acres.

The coastal strand community is a relatively narrow band stretching the length of the project site with exotic species Australian pine (*Casuarina equisetifolia*), lather leaf (*Colubrina asiatica*), beach naupaka (*Scaevola sericia*), seaside mahoe (*Thespesia populnea*), and Brazilian pepper (*Schinus terebinthifolius*) interspersed among native buttonwood (*Conocarpus erectus*), red (*Rhizophora mangle*), black (*Avicennia germinans*), and white mangroves (*Laguncularia racemosa*), inkberry (*Scaevola plumieri*), and seagrape (*Coccoloba uvifera*) trees.

Area 1A. Open Space, Dredge Spoil Piles, Pond, Remnant Tropical Hardwood Hammock; 39.6 acres.

This area is primarily ruderal consisting of herbaceous weeds, grasses, and shrubby area. It is a highly altered area of bare parking lots and expanses of mowed fields interspersed with native buttonwood mangroves. On the coastal and northern perimeter of Area 1A, there are extensive exotics such as Brazilian pepper, Australian pine, seaside mahoe, and beach naupaka. Other native plants, in the areas of denser vegetation, includes seagrape with stands of Spanish stopper (*Eugenia foetida*), and mastic (*Mastichodendron foetidissimum*).

Area 2., 2A., 6., 7., 8., and 9. Tropical Hardwood Hammock, Wetland Areas, Open Space; 66.4 acres.

Noxious exotics include lather leaf, Australian pine, Brazilian pepper, seaside mahoe, beach naupaka, lantana (*Lantana camara*), rosary pea (*Abrus precatorius*), wedelia (*wedelia trilobata*), and several woody ornamentals, such as *Schefflera actinophylla*, Mexican fan palm (*Washingtonia robusta*), carrot wood (*Cupaniopsis anacardioides*), and castor bean (*Ricinus communis*).

This area includes native species such as seagrape with extensive stands of Spanish stopper. Additional trees and shrubs present in these areas include torchwood (*Amyris elemifera*), saffron plum (*Bumelia celastrina*), snowberry (*Chiococca alba*), strangler fig (*Ficus aurea*), Florida privet (*Frestiera segregata*), blolly (*Guapira discolor*), mastic, bloodberry (*Rivina humilis*), black bead (*Pithecellobium keyense*), wild coffee (*Psychotria nervosa*), white indigo berry

(*Randia aculeata*), cabbage palm (*Sabal palmetto*), saw palmetto (*Serenoa repens*), Bahama nightshade (*Solanum bahamense*), wild lime (*Zanthoxylum fagara*), and indigenous vines including virginian creeper (*Parthocissus guinguefolia*) and moon vine (*Ipomoea alba*). Stands of red, black, and white mangroves are present, with seagrape and mastic on the edges of exotic stands.

#### Area 5. Wetland Area; 2.4 acres.

Red, black, white, and buttonwood mangroves are present along with sea purslane (*Sesuvium spp.*), glasswort (*Salicornia spp.*), sea-oxeye daisy (*Borrchia frutescens*) and saltgrass (*Distichlis spicata*). Also present, just landward of mangroves, are seagrape trees, an occasional *Ficus* species, Spanish bayonette (*Yucca spp.*), wild lime, and various palms. Predominant upland exotic vegetation interspersed in this area includes Australian pine, Brazilian pepper, seaside mahoe, beach naupaka, lantana, lather leaf, rosary pea, wedelia, and several woody ornamentals. Also present are opportunistic grasses such as finger grass (*Eustachys spp.*), field grass (*Paspalum spp.*), and crow's foot grass (*Dactyloctenium aegyptium*).

#### Wildlife

Although little wildlife was observed during the field visit to the restoration site, the scattered remnant hammock, coastal strand, mangroves, and wetland pockets do provide important resources for a variety of wildlife species. The island's northwest side is a Critical Wildlife Area managed by the Florida Fish and Wildlife Conservation Commission (FWC). It provides substantial habitat for wading birds, waterfowl, and mangrove-associated fauna. The areas slated for restoration offer additional support for these species and also for those guilds associated with hammock, coastal strand, and freshwater habitat. The beach areas adjacent to the project site also provide foraging and loafing habitat for shorebirds and nesting habitat for sea turtles. The property currently has a relatively low level of human activity, but has historically been utilized as a recreation area, primarily along the beach and in the Virginia Key Beach Park. Even with the historic degree of disturbance, the restoration areas manifest a moderate degree of importance as wildlife habitat. Several species from various guilds expected to be found in the present mosaic include fiddler crab (*Uca pugilator*), tree crab (*Aratus pisonii*), southern leopard frog (*Rana utricularia*), killifish (*Cyprinodontidae*), anoles (*Anolis sp.*), racers (*Coluber constrictor spp.*), great blue heron (*Ardea herodias*), least tern (*Sterna antillarum*) (documented), belted kingfisher (*Ceryle alcyon*), and osprey (*Pandion haliaetus*). The subject site is used by forest remnant birds such as red-bellied woodpeckers (*Centurus carolinus*) and common flickers (*Colaptes auratus*) and suburban species that can tolerate the conditions of these forests. The diversity of bird species in the area has been well documented by bird surveys, including Audubon's Christmas Bird Counts, which began in the 1970s. Migrating songbirds that travel down the Atlantic coast flyway use the coastal maritime hammock for food and shelter, including the pine siskin (*Carduelis pinus*), Tennessee warbler (*Verivora peregrina*), Swainson's thrush (*Catharus ustulatus*), and indigo bunting (*Passerina cyanea*). Additionally, numerous raccoons (*Procyon lotor*) as well as gray foxes (*Urocyon cinereoargenteus*) have been observed in the coastal hammock areas (DERM 1999).

Restoration of these areas will provide enhanced wildlife habitat, which should help increase species' utilization and diversity not presently found on the island. The Service also supports any additional hydrologic improvements including connections to impounded areas.

### THREATENED AND ENDANGERED SPECIES

In a letter dated November 7, 2000, the Service provided the Corps with information on federally listed species which may occur within a two-mile radius of the project site. We have reviewed available information, including the Corps' February 2002 Biological Assessment regarding threatened and endangered species. The Corps has made the determination that the proposed project would not affect the endangered West Indian manatee (*Trichechus manatus*), threatened bald eagle (*Haliaeetus leucocephalus*), and endangered wood stork (*Mycteria americana*), including critical habitat. These species have been documented in the vicinity of Virginia Key. The restoration area does not include critical habitat for any listed species, therefore none will be affected. The Service concurs with the Corps' no effect determination.

The Corps has also determined that the project may affect the endangered American crocodile (*Crocodylus acutus*), the threatened loggerhead sea turtle (*Caretta caretta*), endangered green sea turtle (*Chelonia mydas*), endangered leatherback sea turtle (*Dermochelys coriacea*), endangered hawksbill sea turtle (*Eretmochelys imbricata*), and endangered Kemp's ridley sea turtle (*Lepidochelys kempii*). After discussions with the Service and reevaluating the specific project elements, the Corps revised the initial effect determination to a "may affect, not likely to adversely affect" for these species (Corps 2002a).

#### American crocodile

The American crocodile was listed as an endangered species in 1975. Critical habitat was established for the crocodile was in 1979, but it does not include Virginia Key. The project site is believed to be at the northernmost limits of the present range of the American crocodile, approximately 25 miles north of its designated critical habitat. Anecdotal sightings place the American crocodile in the vicinity of Virginia Key, however, no evidence or sightings have been documented on Virginia Key (R. Hammer, F. Mazzotti, G. Milano; personal communication, 2002). Reports of crocodiles using Fisher Island, north of Virginia Key (R. Hammer, F. Mazzotti, G. Milano; personal communication, 2002), and Key Biscayne to the south (F. Bernal, L. Golden, R. Hammer, F. Mazzotti, G. Milano, K. Walby; personal communication, 2002), are documented. Restoration efforts will create additional suitable habitat for the crocodile (G. Milano, personal communication, 2002), supplementing the mangrove habitat in the Critical Wildlife Area on the northwest side of the island. Due to the potential presence of crocodiles in the area during restoration activities, the Service concurs with the Corps' revised determination that the project may affect, but is not likely to adversely affect the American crocodile.

The Service believe that human/crocodile encounters may increase after the restoration plan is implemented. In light of cultural, historical, educational, and recreational improvements also planned for Virginia Key Beach Park, we recommend that a crocodile management plan be

developed that addresses this issue. In addition, species-level and habitat-level recovery actions, such as those listed in the Service's Multi-Species Recovery Plan (MSRP), should be included. For example, a management plan should include population and habitat surveys, protection and enhancement efforts, and restoration considerations on the west side of Virginia Key.

#### Sea turtles

During the 2000 nesting season, there were 80 loggerhead sea turtle nests monitored on 2.5 miles of beach (FWC 2000). Virginia Key represents potential nesting habitat for other listed turtles species such as the leatherback, green, and hawksbill which also nest on neighboring Key Biscayne (W. Teas, personal communication, 2002).

Of all the marine turtles in this region, only the loggerhead regularly nests on Virginia Key beaches. The loggerhead sea turtle was listed as a federally threatened species on July 28, 1978. Approximately 80 percent of loggerhead nesting in Florida occurs in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (NMFS and Service 1991a). Loggerhead turtle nesting typically occurs between late April to late August, with most nesting occurring in June and July and occasionally in September. Incubation takes 50-75 days depending on nest temperature (Dodd 1992). The loggerhead sea turtle nesting and hatching season for Dade County extends from March 15 through November 30. Incubation ranges about 45 to 95 days. According to the FWC sea turtle nesting database, a first nest date and last nest date recorded for Virginia Key were May 3, 1995, and August 15, 1996, respectively. The following table summarizes sea turtle nesting activity on Virginia Key from 1991 through 2000. The overwhelming majority of these nests were recorded from the northeast shoreline of the island adjacent to the proposed coastal strand restoration area.

#### Sea Turtle Nesting Data for Virginia Key, 1991-2000 (W. Teas, 2002).

Year	Number of Nests	Number of False Crawls
1991	37	75
1992	14	31
1993	40	89
1994	52	100
1995	68	110
1996	53	69
1997	62	175
1998	68	132
1999	64	78
2000	80	192

Only the loggerhead sea turtle has nested on Virginia Key, with the exception of one hawksbill sea turtle nest documented by the FWC Florida Marine Research Institute in 1995. Also, a hybrid sea turtle may have nested on Virginia Key in 2001 (W. Teas, personal communication, 2002). Listed as an endangered species on June 2, 1970, the hawksbill sea turtle is a rare nester

on southeastern beaches, with only 1-2 nests recorded annually on Florida beaches (Lund 1985; McMurtray and Richardson 1985; Conley and Hoffman 1986). Loggerhead turtle nesting has been recorded for the months of June, July, August, and October and from Volusia, Martin, and Dade Counties (Lund 1985; McMurtray and Richardson 1985).

The Corps has agreed to limit use of the beach outside loggerhead turtle nesting and hatching season for Miami-Dade County. During turtle nesting season, March 15 through November 30, the contractor will not access the beach to conduct any portion of coastal strand restoration efforts. In addition, no work will be conducted along the beach slope of the coastal strand. Therefore, the Service concurs with the Corps' determination that the proposed project is not likely to adversely affect listed sea turtles.

The Service's concurrence with the Corps' determination for the project's listed species, fulfills the requirements under section 7 of the ESA and, therefore, no further action is required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, if a new species is listed, then reinitiation of consultation may be necessary. Furthermore, if an unforeseen project timing difficulty necessitates construction activity or access to or on the beach between March 15 and November 30, then reinitiation of consultation for sea turtles will be necessary.

It should be noted the federally endangered beach jacquemontia (*Jacquemontia reclinata*), a member of the morning glory family restricted to the southeast coast of Florida, historically existed on Virginia Key (Service, 1996). Most of the primary habitat of this species, beach coastal strand and maritime hammock, has been destroyed or altered for residential and commercial construction. Beach jacquemontia requires open areas that are typically found on the crest and lee sides of stable dunes (Austin 1979). It may also invade and restabilize maritime hammock or coastal strand communities that have been disturbed by tropical storms, hurricanes, and possibly fire. Other common vegetation on Virginia Key, include sea grape, cabbage palm, poisonwood (*Metopium toxiferum*), Madagascar periwinkle (*Catharanthus roseus*), *Croton involucratus*, gopher apple (*Licania michauxii*), prickly pear cactus (*Opuntia* sp.), sandspurs (*Cenchrus* spp.), sea oats (*Uniola paniculata*) and other shrubs and dwarfed trees (Johnson *et al.* 1993, Lippincott 1990). At nearby Crandon Park, on Key Biscayne, beach jacquemontia exists on the dune slope at the edge of shrubby hammocks. It is currently found in small, widely separated populations in Miami-Dade, Broward, and Palm Beach Counties, where habitat loss and modification has placed it at a high risk of extinction. Fewer than 1,000 individual plants exist (Service, 1999a). The Virginia Key restoration project presents an excellent opportunity for restoration of beach jacquemontia, since reintroduction efforts are needed to ensure the survival of this species (Service, 1995). Generally, beach jacquemontia can be planted in the mid-dune zone within existing bare areas, located in shrub/scrub beach habitats.

Florida State-listed plant species observed in the field include the state-threatened leather fern (*Acrostichum daneifolium*) and inkberry, as well as the Florida Natural Areas Inventory (FNAI) G4 spider lily (*Hymenocallis latifolia*). Both the inkberry and the spider lily occur in the

transition areas between the dune and the coastal hammock, and are present in low numbers. Care should be taken during construction to avoid destruction of these plants.

## DISCUSSION

Habitat types associated with environmental restoration activities on Virginia Key include mangrove wetlands, isolated fresh and brackish water ponds, wetlands, hardwood hammocks, and coastal strands. Much of the existing vegetation in these areas is comprised of dense, well-developed exotic forests. On the 94.4 acres slated for restoration and enhancement, up to 62.4 acres are infested with exotic vegetation. To effectively clear these areas, heavy equipment may be required. Vehicles and heavy equipment used to remove exotic vegetation and transplant native species may temporarily disturb wildlife and fishery resources in both uplands and wetlands. Beach access to perform work along the coastal strand, by machinery, will occur outside the sea turtle nesting and hatching season. A lag time will exist after the restoration work is completed before a full spectrum of endemic fish and wildlife species recovers.

The City of Miami proposed redevelopment efforts aimed at restoring the area to its historical uses, will make Virginia Key Park more accessible and attractive to visitors. New visitor access coupled with the extensive restoration efforts, which will initially decrease forest density, may allow human intrusion into previously difficult-to-access areas. Currently inaccessible, dense forest areas will become accessible with the maintenance of previously unused or the creation of new trails. Currently there is thick overstory and undergrowth vegetative cover on most of the 94.4 acres slated for restoration. As the restored areas recover to denser vegetative growth, human access may be reduced and potential effects to these areas and associated wildlife reduced.

Once exotic vegetation has been cleared and native species are reestablished or enhanced, benefits to terrestrial fauna should occur. Also wading birds such as herons, ibis, and possibly roseate spoonbill and woodstorks, and migratory birds such as warblers, buntings, vireo, and cardinals, should benefit from the project. Virginia Key's restoration project will ultimately provide vital habitat improvements for a variety of fish and wildlife species. Many rare migratory and wintering bird species may utilize the site after restoration, including the least tern, great white heron (*Ardea occidentalis*), lesser black-backed gull (*Larus fuscus*), peregrine falcon (*Falco peregrinus*), merlin (*Falco columbarius*), and brown pelican.

Although crocodiles have not been documented on Virginia Key, the potential for habitat utilization does exist. Similar restoration efforts were performed within sight of the American crocodile at Bill Baggs State Park and Cape Florida State Park, south of the project site. These animals did not attempt to leave the area or appear to be stressed by the construction activity (G. Milano, personal communication, 2002). Crocodile nesting habitat should improve as a result of the project and habitat may be colonized as a result of the removal of dense Australian pine and Brazilian pepper stands (Service 1999).



The Corps has proposed the following efforts to eliminate potential impacts on listed species:

- Restoration activities will be managed to minimize disturbance to wildlife resources by avoiding beach access during sea turtle nesting and hatching season.
- Prior to the commencement of construction, the contractor will be required to inform all personnel associated with the project of the potential presence of all threatened and endangered species, including the American crocodile and sea turtles. The contractor will educate all project personnel as to what these species look like, where they might be found, and how to avoid interaction with them, and the civil and criminal penalties for harming, harassing, or killing them.

### RECOMMENDATIONS

The Service supports the proposed ecological restoration for Virginia Key, given the present condition of the areas slated for restoration and enhancement. However, the Service offers the following recommendations to further minimize disturbance and to supplement restoration efforts:

- Beach access to restoration areas by vehicles or heavy equipment should occur outside the sea turtle nesting and hatching season between March 15 and November 30.
- Recreational amenities or increased human access to the existing natural areas provided by the restoration project or the adjacent Park restoration, should be compatible with the project's primary purpose of environmental enhancement. Environmental planning and public education efforts should occur to help minimize harmful human interactions with threatened and endangered species and other fish and wildlife resources.
- A comprehensive post-project monitoring plan should be included in the project plans. The monitoring plan should include periodic vegetation surveys and should evaluate the hydrology of proposed wetlands and ponds. Reports should be submitted to the Corps and the Service and include photo documentation (digital preferred) describing the status of restoration efforts, including exotic vegetation status, native planting status, and fish and wildlife survey data.
- Project plans should stipulate that a qualified person(s), knowledgeable in local upland and wetland botany and coastal restoration, be present during land clearing to ensure minimal damage to native species. This person(s) should also direct selection and planting of native species, as well as any tidal tributary and wetland pond excavation.
- A beach jacquemontia reestablishment program should be considered. Efforts to reintroduce the beach jacquemontia at nearby Crandon Park can provide relevant information and experience in planting this species on Virginia Key.
- A crocodile management and monitoring plan should be developed for Virginia Key.

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## FIGURES

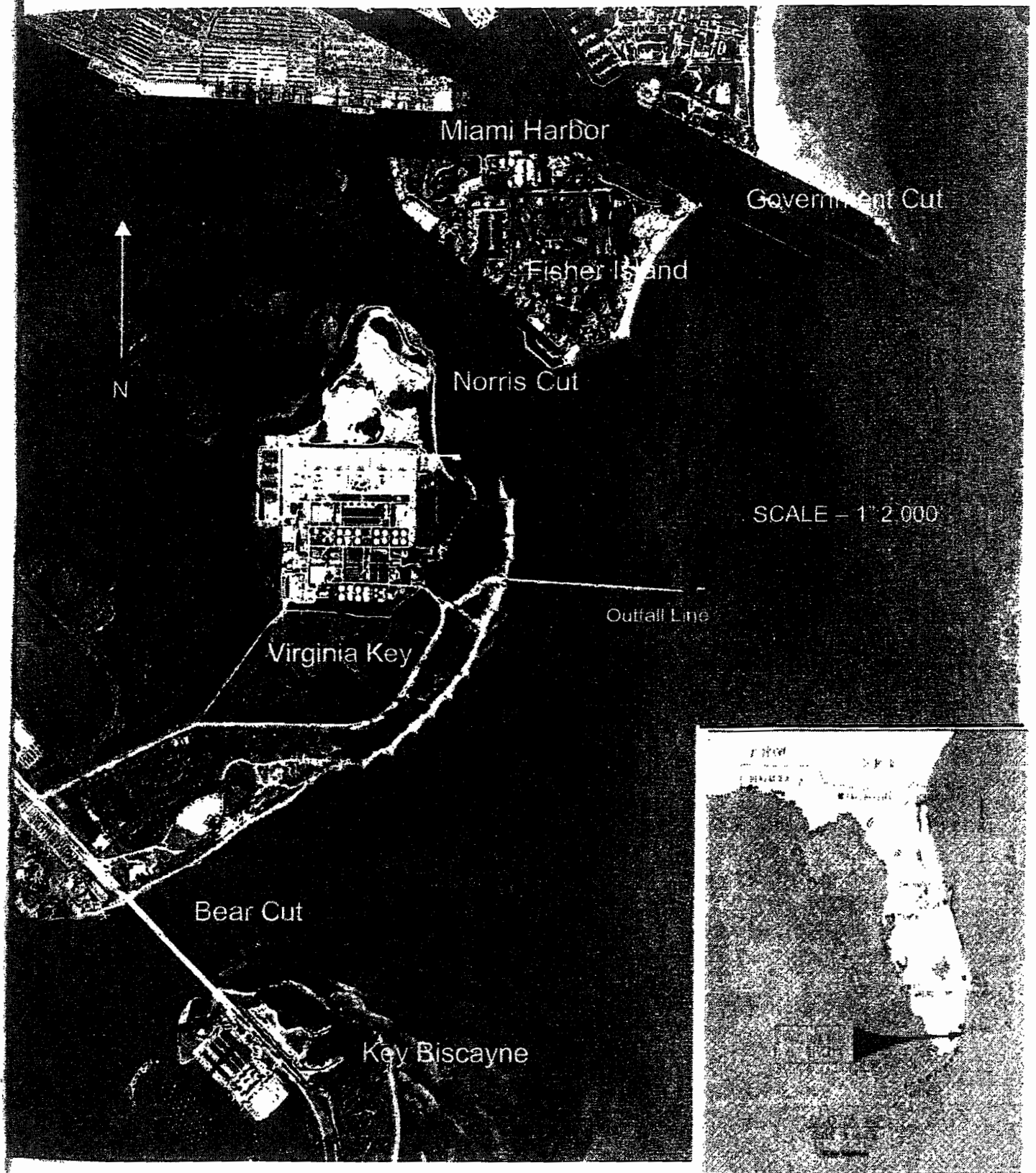


FIGURE 1: Study Area Map



**APPENDIX**

**National Marine Fisheries Service correspondence  
June 22, 2002**



**UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE**

Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

June 22, 2002

**RECEIVED**  
JUN 27 2002

BY: Wubak

Mr. James Slack  
U.S. Fish and Wildlife Service  
South Florida Ecological Services Office  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960

Dear Mr. Slack:

The National Marine Fisheries Service (NMFS) has reviewed your letter dated May 8, 2002, and the Draft Fish and Wildlife Coordination Act Report (CAR), prepared by the U.S. Fish and Wildlife Service (FWS) for the **Virginia Key Environmental Restoration Project** in Dade County, Florida. The proposed project involves restoration and enhancement of approximately 94 acres of upland and wetland habitats located adjacent to and within the 132-acre city park on Virginia Key. The goal of the restoration project is to enhance fish and wildlife habitats on Virginia Key that were previously impacted by dredged material disposal during Federal improvements at the Port of Miami.

According to the draft CAR, the Army Corps of Engineers intends to conduct the restoration activities in concert with development of historic Virginia Key Beach Park. The restoration and enhancement activities proposed for this project include removal of exotic vegetation from approximately 83.1 acres of tropical hardwood hammock, 6.9 acres of coastal strand, and 2.4 acres of interior freshwater wetlands. The construction of a two acre freshwater pond is also proposed and native upland and wetland vegetation would be planted in the restored areas. The proposed project is expected to restore native vegetation and wildlife habitat and provide hydrological improvements to impounded areas on the property. According to the draft CAR, the proposed restoration activities on Virginia Key may provide suitable habitat for a number of rare migratory and wintering bird species, as well as the endangered American crocodile. The 2.5-mile-long beach on the east side of Virginia Key is a documented nesting habitat for the threatened loggerhead turtle.

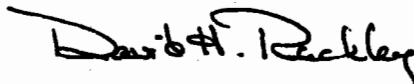
It is the NMFS's assessment that the proposed restoration project, with the inclusion of recommendations discussed in the draft CAR, would improve fish and wildlife habitat. We concur with the recommendations of the FWS regarding project design and implementation. In particular, the NMFS agrees that the following measures should be incorporated into the Virginia Key Restoration Project:



1. Recreational amenities and other features associated with the historical development of Virginia Key should be compatible with the environmental restoration project's goals and purpose. In this regard, environmental planning and public education efforts should be coordinated to effectively minimize harmful human interactions with threatened and endangered species and other fish and wildlife resources.
2. A comprehensive environmental monitoring plan should be developed and included in the project plan. The monitoring plan should include periodic vegetation and hydrological surveys within the restoration areas to assess the success of the project and determine the need for additional planting of vegetation or hydrological modifications.
3. The proposed restoration project should include a crocodile management and monitoring plan for Virginia Key.

We appreciate the opportunity to provide these comments. Related correspondence should be addressed to the attention of Mr. Mike Johnson at our Miami Office. He may be reached at 11420 North Kendall Drive, Suite #103, Miami, Florida 33176, or by telephone at (305) 595-8352.

Sincerely,



for

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division

cc:

F/SER3

F/SER4

F/SER43-Johnson



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Florida Ecological Services Office  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960



May 8, 2002

James C. Duck  
Chief, Planning Division  
U.S. Army Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

In accordance with the Fiscal Year 2001 Transfer Fund Agreement between the Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers Jacksonville District, attached is the Draft Fish and Wildlife Coordination Act (FWCA) Report on the Virginia Key Environmental Restoration project, Miami-Dade County, Florida. This draft report, provided in accordance with the FWCA (48 Stat.401, as amended; 16 U.S.C. 661 *et seq.*) and under the provisions of section 7 of the Endangered Species Act of 1973 (16 U.S.C., as amended, 1531 *et seq.*) (ESA), has been prepared to provide an evaluation of environmental effects on restoration of approximately 94.4 acres on Virginia Key.

By copy of this letter, the Service is soliciting comments within 45 days from the Florida Fish and Wildlife Conservation Commission and the National Marine Fisheries Service. Comments by both agencies will be considered by the Service in preparing the final FWCA report, and copies of the comments will be included as appendices to the final report, which will then constitute the Secretary of the Interior's views and recommendations for this project, in accordance with section 2(b) of the Act.

Please contact Andrew Gude at (305) 872-5563, regarding the findings and recommendations contained in this draft report.

Sincerely yours,

James J. Slack  
Field Supervisor  
South Florida Ecological Services Office

**James C. Duck**

**May 8, 2002**

**Page 2**

**cc:**

**FWC, Vero Beach, FL**

**NMFS, Miami, FL**

**DERM, Miami, FL**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

South Florida Ecological Services Office

1339 20<sup>th</sup> Street

Vero Beach, Florida 32960

November 7, 2000

James C. Duck  
Chief, Planning Division  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

Thank you for your letter and attachments to the Fish and Wildlife Service (Service) dated July 26, 2000, concerning technical assistance for a proposed shore protection and environmental restoration at Virginia Key Beach Park in Miami-Dade County, Florida. Virginia Key is a barrier island located south of Fisher Island and north of Key Biscayne, with the Atlantic Ocean to the east and Biscayne Bay to the west. This letter provides technical assistance on the protection and conservation of fish and wildlife resources in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

### PROJECT DESCRIPTION

The Army Corps of Engineers (Corps) is evaluating the feasibility of developing alternatives for improvements to the beach and to determine if further Federal action is recommended. You have also requested the participation of the Service in the development of the Project Study Plan, should the reconnaissance study conclude with a recommendation to continue into the feasibility study phase. The Corps is preparing a reconnaissance study for the shore protection and environmental restoration of Virginia Key Beach Park. The study is authorized under the authority for the Biscayne Bay Feasibility Study, which was authorized by Congress in 1982. The study was requested in a letter dated April 14, 2000, from U.S. Representative Carrie P. Meek, Congressional District 17.

Several potential alternatives for shore protection are being considered. These alternatives include constructing rock groins perpendicular to the shoreline, restoring some of the existing timber groins, removing the remaining timber groins, constructing a shore parallel breakwater, and/or placing beach sand along the eroding shoreline. Alternatives being considered for environmental restoration include removing exotic vegetation from wetlands and upland sites and restoring with native vegetation; restoring tidal flushing to the area as appropriate; creating beach dune habitat; and providing recreational features such as the pedestrian bridges, dune crossovers, boardwalks, interpretive signage and swimming buoys. Preliminary project scope includes restoration of the park's lagoon, wetlands, and indigenous plants. Non-native plants



would be removed. The existing bathrooms and concessions at the park are also proposed for renovations by the City of Miami Public Works and Parks Department.

### THREATENED AND ENDANGERED SPECIES

The Service has reviewed the information in your letter and attachments and examined information available to us on the presence of threatened and endangered species and trust resources in the vicinity of the proposed project. The coastal sandy beaches along Virginal Key provide habitat suitable for sea turtle nesting. Species most likely to nest in the project vicinity include the federally threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), the endangered leatherback sea turtle (*Dermochelys coriacea*), and the endangered hawksbill sea turtle (*Eretmochelys imbricata*). The Service recommends that the Corps evaluate the level of nesting activities at the beach, the timing of the proposed beach renourishment, the grain size and mineral compatibility of the proposed fill material, and possible turbidity impacts from the fill material. The placement of rock and timber groins may impact the ability of nesting turtles to access the beach and may also interfere with hatchlings traveling to the water following their emergence from nests. The amount of nearshore habitat that will be impacted also needs to be quantified and possible environmental impacts assessed. These factors must be addressed by the Corps to allow the Service's review of project impacts to listed sea turtles.

The marine and estuarine waters and adjacent seagrass beds provide foraging habitat for the federally endangered West Indian manatee (*Trichechus manatus*). The Service recommends that the Corps provide an evaluation of project impacts to the manatee from construction actions and project impacts to foraging habitat for this species.

The mangrove forest and lagoon on the northern end of Virginia Key provide suitable habitat for the endangered American crocodile (*Crocodylus acutus*). Crocodiles are known to be present in the project area and may be nesting along the edge of the mangrove wetlands. Crocodile/human encounters are a likely occurrence in the project area and the Service recommends that a crocodile management plan be developed that addresses this issue. Portions of the project area are occupied by crocodiles, but the occupied habitat is not part of the designated critical habitat for this species.

### FISH AND WILDLIFE RESOURCES

Mangroves are rare and important estuarine resources in Miami-Dade County. One of the primary functions that these tree species provide is shoreline stabilization. In addition, mangroves provide an invaluable contribution to the biodiversity of the marine and estuarine community. The mangrove forests of South Florida are a vital component of the estuarine and marine environment, providing a major detrital base to organic food chains, significant habitat for arboreal, intertidal and subtidal organisms, nesting sites, cover and foraging grounds for birds, and habitat for some reptiles and mammals. The mangrove forest provides protected

nursery areas for fishes, crustaceans, and shellfish that are important to both commercial and sport fisheries.

The value and central role of mangroves in the ecology of South Florida has been well established by numerous scientific investigations directed at primary productivity, food web interactions, listed species, and support of sport and commercial fisheries. Mangroves are important in recycling nutrients and the nutrient mass balance of the estuarine ecosystem. They are one of the highest primary and associated secondary biologically productive ecosystems in the world. Mangroves provide one of the basic food chain resources for arboreal life and nearshore marine life through their leaves, wood, roots, and detrital materials. This primary production forms a significant part of the base of the arboreal, estuarine, and marine food web. Mangroves have a significant ecological role as physical habitat and nursery grounds for a wide variety of marine/estuarine vertebrates and invertebrates. Many of these species have significant sport fishery and/or commercial fishery value. This tropical ecosystem is a habitat unique in the continental United States. They deserve special protection because of this uniqueness and because of the multiple ecological functions they provide. Mangroves have a significant ecological role as habitat for endangered and threatened species, and species of special concern. For several of these species, the habitat is critical and vital to their continued survival. Mangroves serve as storm buffers by functioning as wind breaks and through prop-root baffling of wave action. Mangrove roots stabilize shorelines and fine substrates, reducing turbidity, and enhancing water clarity. Mangroves improve water quality and clarity by filtering upland runoff and trapping waterborne sediments and debris. Unaltered mangroves contribute to the overall natural setting and visual aesthetics of Florida's estuarine waterbodies. Through a combination of the above functions, mangroves contribute significantly to the economy of the coastal counties of South Florida and the State of Florida.

The adjacent seagrass beds provide a unique aquatic resource to the South Florida environment. Seagrasses are a highly productive, faunally rich, and ecologically important habitat within the coastal lagoons and estuaries of South Florida. In terms of primary productivity, a seagrass bed can produce four to ten times the weight of organic matter as that produced by a cultivated corn field of the same size. Vast, extensive seagrass beds covering hundreds of kilometers may be composed of one to maybe four species. Yet, hundreds to thousands of species of flora and fauna may inhabit these beds, utilizing the food, substrate, and shelter provided by these submerged plants. Rapidly growing seagrass leaves provide food for trophically higher organisms via direct herbivory or from the detrital food web. The structure formed by these leaves offers shelter and protection. This combination of shelter and food availability results in seagrass beds being the richest nursery grounds in South Florida's shallow coastal waters. As such, many commercial and recreational fisheries (e.g., clams, shrimp, lobster, fish) are associated with seagrass beds. Seagrasses have experienced declines in abundance and distribution due to water quality degradation and through the direct loss of habitat related to dredge and fill activities (e.g., navigation channels, marinas) and boating impacts (e.g., propeller scars and groundings). The degradation of water quality is largely the result of point source pollution (e.g., wastewater discharge, agricultural runoff, excessive freshwater discharge), nonpoint source pollution (e.g., stormwater runoff, leaching from septic tanks), and the alteration of adjacent watersheds. The

subsequent decline in seagrasses has significantly reduced the fisheries resources in South Florida. Implementation of several protective and restorative measures has improved water quality and reduced the rate of habitat loss within South Florida's estuaries. Such measures include the regulation of dredge and fill activities, the elimination of wastewater discharge to surface waters, the treatment of stormwater runoff, and the rehabilitation of adjacent watersheds. Turbidity associated with the fill placement may also affect marine species that reside and forage in the adjacent seagrass beds.

The Service recommends that the Corps review and evaluate the proposed project's impacts to these resources and provide in the alternatives evaluation actions that may be implemented to reduce impacts to these resources.

Thank you for the opportunity to participate as a team member in the preparation of a Project Study Plan for the proposed activity. The Service would be pleased to provide additional assistance, as available resources allow, to assist the Corps in the Project Study Plan. If you have any questions, please contact Mr. Allen Webb at (561) 562-3909, extension 246.

Sincerely yours,



James J. Slack  
Field Supervisor  
South Florida Ecological Services Office

cc:

NMFS, Andreas Mager, St. Petersburg, FL  
EPA, West Palm Beach, FL  
FWC, Stephen R. Lau, Vero Beach, FL  
FDEP, Keith J. Mille, Tallahassee, FL  
Miami-Dade County DERM, Stephen Blair, Miami, FL



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

September 20, 2000

James C. Duck, Chief  
Planning Division, Environmental Branch  
Department of the Army, Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

The National Marine Fisheries Service (NMFS) has reviewed your letter dated July 20, 2000, requesting comments regarding the Expedited Reconnaissance Study for shore protection and environmental restoration at Virginia Key Beach Park in Dade County, Florida.

According to the study description provided, alternatives being considered for shore protection at the site include: constructing rock groins perpendicular to shore, restoring some existing timber groins and removing the remaining timber groins, constructing a breakwater parallel to shore, and/or placing beach fill along the shoreline. Alternative being considered for environmental restoration include: exotic vegetation removal and restoring native vegetation, restoring tidal flushing to some areas, creating beach dune habitat, and providing various recreational features.

Although the study description did not include information regarding aquatic resources and potential adverse impacts to them, several NMFS trust resources may exist within the area of the study. Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, the South Atlantic Fishery Management Council (SAFMC) has identified Essential Fish Habitat (EFH) that may exist in the project area for species they manage including shrimp, the snapper-grouper complex (containing ten families and 73 species), Spanish and king mackerel, red drum, coral, and coral reef communities, and spiny lobster. The NMFS has identified EFH for highly migratory species that include billfishes and species of sharks that inhabit this area, such as nurse, blacktip, sandbar, lemon, and bull sharks. Various life stages of some managed species that may be found in the project area include larvae, postlarvae, juvenile and adult stages of red, gray, lane, schoolmaster, mutton and yellowtail snappers; scamp, speckled hind, red, yellowedge and gag groupers; Spanish and king mackerel; red drum; white grunt; and spiny lobster.

Categories of EFH that may be adversely impacted include marine water column, live/hard bottoms, coral, coral reefs, and artificial/manmade reefs, seagrasses, estuarine scrub/shrub mangroves, and intertidal flats. The SAFMC has identified EFH Habitat Areas of Particular Concern (HAPC) which may occur within the project area. HAPCs are subsets of EFH that are rare, particularly susceptible



to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning, and rearing of fish and shellfish have been included within HAPC. Specifically, categories of HAPC that may exist within the vicinity of the proposed project include hermatypic coral habitat and reefs, hard bottom habitats, and submerged aquatic vegetation. In addition, Biscayne National Park and Biscayne Bay are adjacent to the project location and are two geographically defined HAPC's (Biscayne Bay is also designated as an Outstanding Florida Water by the Florida Fish and Wildlife Conservation Commission).

In addition to EFH for Federally managed species, hard bottom, coral, seagrass, mangrove, and shallow nearshore habitats provide nursery, foraging, and refuge habitat for other commercially and recreationally important fish and shellfish. Species such as blue crab, flounder, spotted seatrout, pompano, snook, striped mullet, tarpon, and a variety of reef fish and tropical fish are among the many species that utilize these habitats.

The potential sources of sand for the beach fill alternative were not discussed. Dredging sand from offshore borrow areas have been known to cause mechanical, siltation, and turbidity induced impacts to coral reefs and hard bottom habitats. Placement of sand along the shoreline and into nearshore waters may also impact corals, hard bottom, and seagrass habitat in similar manners.

Siltation can be detrimental to the growth and survival of reefs and the majority of associated species, especially filter-feeding organisms such as hard corals, sponges, and soft corals (Hay and Sutherland 1988). Other organisms such as algae, crustaceans, and fishes also can be adversely affected (Marszalek 1981; Goldberg 1989; Nelson 1989). Turbidity impacts are chronic perturbations that cause long-term reductions in primary and secondary productivity of reef and hard bottom communities by reducing water clarity and light penetration. Elevated turbidity levels near hard bottom and coral reef habitat is particularly detrimental to photosynthetic organisms such as corals and algae (Dodge and Vaisnys 1977; Bak 1978). Because many organisms associated with nearshore hard bottom habitats are sessile and have no ability to burrow up through the sediment, the survivability of these communities after renourishment is minimal (Dodge and Vaisnys 1977; Marszalek 1981). The loss of primary production within the area of the fill placement eliminates an essential foraging resource for juvenile fish, turtles, and invertebrates.

At least eighty-six taxa of fish have been quantified among nearshore hard bottom habitats along southeast mainland Florida; including at least 34 species of juvenile reef fish which may utilize these habitats as nursery areas (Lindeman and Snyder 1999). Gilmore and Herrema (1981) recorded 107 species of fish from the littoral and sublittoral surf zone reefs of central-east Florida. Green, hawksbill, leatherback, and loggerhead turtles are known to nest and forage in Dade County and are protected by the NMFS and U.S. Fish and Wildlife Service under the Endangered Species Act of 1973. Between 10 and 16 nests per kilometer were reported annually for loggerhead turtles on Virginia Key Beach, and one endangered hawksbill turtle nest has been recorded (Florida Marine Research Institute 2000). Several studies have determined that nearshore hard bottom habitats along the southeast Florida coast

are important as nursery habitat for juvenile green turtles and loggerheads (Guseman and Ehrhart 1990; Wershoven 1992). These studies have concluded that juvenile and adult turtles feed upon the large biomass of macroalgae available on these nearshore hard bottom habitats.

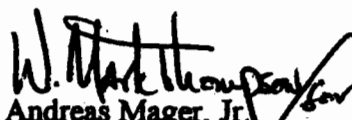
The placement of beach fill along the existing shoreline should only be considered after determination that nearshore seagrasses, corals, and hard bottom habitats will not be adversely affected by the action. Physical characteristics of fill material should match that of existing beach sand to minimize turbidity and provide appropriate turtle nesting habitat characteristics.

The construction of groins and a breakwater within shallow marine habitats along the shoreline may cause direct impacts to seagrass beds and nearshore hard bottom habitats by burial. Seagrass beds may also be indirectly impacted by erosion or increased wave energy due to alteration in the hydrology from the structures. The proposed groins and breakwater may adversely affect sea turtles by reducing or inhibiting the ability of adult female turtles to access the beach during nesting season, of hatchlings during emigration from the beach, and juveniles/adults for foraging in nearshore hard bottom habitats. Groins and breakers may also cause erosion of nesting beach habitat downdrift of these structures.

The NMFS supports the alternatives for environmental restoration of the area including the removal of exotic vegetation, restoration of native vegetation, restoration of natural tidal flushing, creation/enhancement of beach dune habitat, and construction of low-impact recreational features.

We appreciate the opportunity to provide these comments. If we can be of further assistance, please advise. Related comments, questions or correspondence should be directed to Michael R. Johnson in Miami. He may be contacted at 305-595-8352.

Sincerely,

  
Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division

cc:  
EPA, WPB  
DEP, WPB  
SAFMC, CHAS  
FFWCC, TALL  
FWS, VERO  
NMFS, SEFSC-Goodyear  
F/SER3  
F/SER4



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STATE OF FLORIDA  
**DEPARTMENT OF COMMUNITY AFFAIRS**

*"Dedicated to making Florida a better place to call home"*

**JEB BUSH**  
Governor

**STEVEN M. SEIBERT**  
Secretary

September 11, 2000

Mr. James C. Duck  
Department of the Army  
Jacksonville District Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

RE: Department of the Army - District Corps of Engineers - Section 905(b) Expedited  
Reconnaissance Study - Shore Protection and Environmental Restoration -  
Virginia Key Beach Park - Miami-Dade County, Florida  
SAI: FL200007310528C

Dear Mr. Duck:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

The Department of Environmental Protection (DEP) offers a number of comments and recommendations regarding the proposed project. DEP notes that the placement of riprap at or above the mean high water line would require an Environmental Resource Permit regulatory permit and a Consent of Use for sovereignty, submerged lands. Additional permits may be required depending on the alternatives selected. DEP looks forward to working with the Corps and the community to develop a viable project. Please refer to the enclosed DEP comments.

The South Florida Water Management District (SFWMD) notes that, under the operating agreement between the Department of Environmental Protection (DEP) and the SFWMD, this project will be reviewed by DEP. Please refer to the enclosed SFWMD comments.

Based on the information contained in the above-referenced project proposal and the enclosed comments provided by our reviewing agencies, the state has determined that the above-referenced project is consistent with the Florida Coastal Management Program.

**2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100**

Phone: 850.488.8466/Suncom 278.8466 FAX: 850.921.0781/Suncom 291.0781

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**EMERGENCY MANAGEMENT**  
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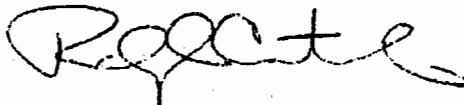
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2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100

Mr. James C. Duck  
September 11, 2000  
Page Two

In addition, the South Florida Regional Planning Council (SFRPC) has identified the policies and goals of its Strategic Regional Policy Plan which may apply to the proposed activity. The comments provided by the SFRPC are enclosed for your review and consideration.

If you have any questions regarding this letter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 414-5495.

Sincerely,

A handwritten signature in dark ink, appearing to read 'R. Cantral', with a stylized flourish at the end.

Ralph Cantral, Executive Director  
Florida Coastal Management Program

RC/cc

Enclosures

cc: Robert Hall, Department of Environmental Protection  
Jim Golden, South Florida Water Management District  
Eric Silva, South Florida Regional Planning Council



Jeb Bush  
Governor

# Department of Environmental Protection

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

David B. Struhs  
Secretary

August 31, 2000

Ms. Cherie Trainor  
Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

**RECEIVED**  
SEP 05 2000  
State of Florida Clearinghouse

Re: Department of the Army, District Corps of Engineers, Section 905(b) Expedited  
Reconnaissance Study, Shore Protection and Environmental Restoration, Virginia Key  
Beach Park, Miami-Dade County

SAI: FL20007310528C

Dear Ms. Trainor:

This Department has reviewed the above-described project proposal and based on the information provided, we submit the following comments and recommendations.

## Comments:

Virginia Key Beach Park possesses a unique array of plant species within its beachfront dune, coastal strand, marine hardwood hammock and mangrove wetland communities. The Florida Natural Areas Inventory (FNAI) lists several rare plants found on the Key, including Biscayne prickly ash, the broad-leafed spider lily, the burrowing four-o'clock the necklace pod, and the sea lavender (see attached FNAI report dated August 10, 2000). Virginia Key Beach also provides important habitat for several species of shorebirds including the following threatened or endangered species: peregrine falcon, bald eagle, piping plover, and the roseate spoonbill. A gopher tortoise has also been observed at the site.

The study proposal lists potential shore protection and environmental restoration projects in conjunction with its site map. Additional details are needed on the alternatives being considered, in order to more accurately assess the potential benefits and impacts of this project. The beach has experienced significant erosion in this area, and since erosion has the potential to impact species whose dune habitat may be reduced or eliminated, a thorough evaluation of listed project alternatives would be desirable to include the following concerns:

1. Seagrass beds are plentiful in the study area and manatee observations are common in the nearby offshore waters of Virginia Key. Beach restoration efforts should address potential impacts to this resource.

"More Protection, Less Process"

Printed on recycled paper.

2. Virginia Key Beach is a nesting area of the loggerhead sea turtle (*Caretta caretta*). In 1994, the National Marine Fisheries Service documented 52 nests on the island. Shore protection efforts should consider compatibility with nesting sea turtles including the suitability of fill, if proposed.
3. A 1990 FNAI report indicated that most of the island is covered by a strand of Australian Pine (*Casuarina equisetifolia*). Any beach restoration should include removal of this exotic species, as its uprooting can contribute to accelerated beach erosion.
4. The proposed Restoration of tidal flow should be accompanied by an evaluation of alternatives for the disposal or placement of spoil material
5. Management requirements of the Biscayne Bay Aquatic Preserve are spelled out in Chapter 18-18, Florida Administrative Code. Special attention should be paid to Section 18-18.005, F.A.C., *General Management Criteria*, and Section 18-18.006, F.A.C., *Uses, Sales, Leases or Transfers of Interests in Lands or Materials Held by the Board*.

**Recommendations:**

In order to protect the shoreline from further erosion, staff recommends that the Corps explore either the restoration of existing timber groins, or the placement of riprap at or above the line of mean high water. It is felt that these alternatives would have the least impacts to wetland and submerged aquatic vegetation. The placement of riprap at or above the mean high water line would require an ERP regulatory permit and a Consent of Use for sovereignty, submerged lands. Other permits may be required depending on the alternatives selected. The department looks forward to working with the Corps and the community to develop a viable project.

Thank you for the opportunity of commenting on this proposal. If you have any questions regarding this letter please give me a call at (850) 487-2231.

Sincerely,



Robert W. Hall

Office of Intergovernmental Programs

**Attachment**

cc: Anna Marie Hartman  
David Mayer  
Cheryl McKee  
Jayne Bergstrom

COUNTY: Miami-Dade

DATE: 07/31/2000  
COMMENTS DUE DATE: 08/30/2000  
CLEARANCE DUE DATE: 09/11/2000  
SAI#: FL20000731052

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
Fish & Wildlife Conserv. Comm  
State  
X Transportation

South Florida WMD

Environmental Policy/C & ED

RECEIVED  
AUG 04 2000

State of Florida Clearinghouse

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized one of the following:

Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.

X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.

Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.

Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of the Army - District Corps of Engineers - Section 905(b) Expedited Reconnaissance Study - Shore Protection and Environmental Restoration - Virginia Key Beach Park - Miami-Dade County, Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

☒ No Comment  
☐ Comments Attached  
☐ Not Applicable

☒ No Comment/Consistent  
☐ Consistent/Comments Attached  
☐ Inconsistent/Comments Attached  
☐ Not Applicable

From:

Division/Bureau: PFDOF

Reviewer: Andrea R. Palmer

Date: 8/3/00



AUG-04-2000 11:50

SFWMD-REG

561 682 6896 P.02/03

DATE: 07/31/2000

COUNTY: Miami-Dade

COMMENTS DUE DATE: 08/30/2000

CLEARANCE DUE DATE: 09/11/2000

Message:

SAI#: FL2000073

## STATE AGENCIES

Community Affairs  
Environmental Protection  
Fish & Wildlife Conserv. Comm  
State  
Transportation

## WATER MANAGEMENT DISTRICTS

X South Florida WMD

## OPB POLICY UNITS

Environmental Policy/C &amp; ED

RECEIVED  
AUG 02 2000  
ERR - 4210

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## Project Description:

Department of the Army - District Corps of Engineers - Section 905(b) Expedited Reconnaissance Study - Shore Protection and Environmental Restoration - Virginia Key Beach Park - Miami-Dade County, Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 202-5438)  
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

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☐ Comments Attached  
☐ Not Applicable

- ☐ No Comment/Consistent  
☐ Consistent/Comments Attached  
☐ Inconsistent/Comments Attached  
☒ Not Applicable

UNDER THE OPERATING AGREEMENT BETWEEN DEP AND THE SFWMD,  
THIS PROJECT WILL BE REVIEWED BY DEP.

From:

Division/Bureau: ERR

Reviewer: JEA GOLDEN

Date: 8/4/00

COUNTY: Miami-Dade

DATE: 07/31/2000

COMMENTS DUE DATE: 08/30/2000

CLEARANCE DUE DATE: 09/11/2000

SAI#: FL2000073105281

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
Fish & Wildlife Conserv. Comm  
State  
Transportation

South Florida WMD

X Environmental Policy/C & ED

RECEIVED  
AUG 14 2000

State of Florida Clearinghouse

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To: Florida State Clearinghouse  
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☒ No Comment  
☐ Comments Attached  
☐ Not Applicable

☐ No Comment/Consistent  
☐ Consistent/Comments Attached  
☐ Inconsistent/Comments Attached  
☐ Not Applicable

From:

Division/Bureau:

Reviewer:

Date:

E. G. O. P. B. Env Policy  
M. B. B. B.  
8/10/2000

South  
Florida  
Regional  
Planning  
Council



FL 200007310528C

RECEIVED  
AUG 17 2000

August 15, 2000

State of Florida Clearinghouse

Ms. Cherie Trainor  
Florida State Clearinghouse  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100

RE: SFRPC #00-0759 - Response to a request for comments on the expedited reconnaissance study for the combined shore protection and environmental restoration at the Virginia Key Beach Park, U.S. Department of the Army, Miami-Dade County.

Dear Ms. Trainor:

We have reviewed the above-referenced project and have the following comments:

- Beaches and dune systems are identified as natural resources of regional significance in the *Strategic Regional Policy Plan for South Florida*. Council staff supports the implementation of beach renourishment projects for the purposes of providing storm protection for upland property, restoring dunes and maintaining eroding beaches. Staff supports the use of buffer zones to protect these important resources.
- The use of groins and other hard coastal protection structures may adversely impact benthic resources and deprive downdrift shorelines of sand. Sand movement and downdrift erosion should be monitored on a region wide basis to ensure the livelihood of wildlife habitats and the stability of renourished areas. All actions should be consistent with the goals and policies of the Miami-Dade County comprehensive plan.
- In addition, the permit application indicates that the project may impact sea turtles and essential fish habitat. Staff recommends that, if the proposed actions are implemented, 1) impacts to the natural systems be minimized to the greatest extent feasible and 2) the permit grantor determine the extent of sensitive marine life and vegetative communities in the vicinity of each project and require protection and or mitigation of disturbed habitat. These guidelines will assist in reducing the cumulative impacts to native plants and animals, wetlands and deep water habitat and fisheries that the goals and policies of the *Strategic Regional Policy Plan for South Florida* seek to protect.
- The goals and policies of the *Strategic Regional Policy Plan for South Florida*, in particular those indicated below, should be observed when making decisions regarding this project.

**Strategic Regional Goal**

- 3.1 Eliminate the inappropriate uses of land by improving the land use designations and utilize land acquisition where necessary so that the quality and connectedness of Natural Resources of Regional Significance and suitable high quality natural areas is improved.

**Regional Policies**

- 3.1.1 Natural Resources of Regional Significance and other suitable natural resources shall be preserved and protected. Mitigation for unavoidable impacts will be provided either on-site or in identified regional habitat mitigation areas with the goal of providing the highest level of resource value and function for the regional system. Endangered faunal species habitat and populations documented on-site shall be preserved on-site. Threatened faunal species and populations and species of special concern documented on-site, as well as critically imperiled, imperiled and rare plants shall be preserved on-site unless it is demonstrated that off-site mitigation will not adversely impact the viability or number of individuals of the species.
- 3.1.9 Degradation or destruction of Natural Resources of Regional Significance, including listed species and their habitats will occur as a result of a proposed project only if:
- a) the activity is necessary to prevent or eliminate a public hazard, and
  - b) the activity is in the public interest and no other alternative exists, and
  - c) the activity does not destroy significant natural habitat, or identified natural resource values, and
  - d) the activity does not destroy habitat for threatened or endangered species, and
  - e) the activity does not negatively impact listed species that have been documented to use or rely upon the site.
- 3.1.10 Proposed projects shall include buffer zones between development and existing Natural Resources of Regional Significance and other suitable natural resources. The buffer zones shall provide natural habitat values and functions that compliment Natural Resources of Regional Significance values so that the natural system values of the site are not negatively impacted by adjacent uses. The buffer zones shall be a minimum of 25 feet in width. Alternative widths may be proposed if it is demonstrated that the alternative furthers the viability of the Natural Resource of Regional Significance, effectively separating the development impacts from the natural resource or contributing to reduced fragmentation of identified Natural Resources of Regional Significance.

#### Strategic Regional Goal

- 3.4 Improve the protection of upland habitat areas and maximize the interrelationships between the wetland and upland components of the natural system.

#### Regional Policies

- 3.4.4 Require the use of ecological studies and site and species specific surveys in projects that may impact natural habitat areas to ensure that rare and state and federally listed plants and wildlife are identified with respect to temporal and spatial distribution.
- 3.4.5 Identify and protect the habitats of rare and state and federally listed species. For those rare and threatened species that have been scientifically demonstrated by past or site specific studies to be relocated successfully, without resulting in harm to the relocated or receiving populations, and where *in-situ* preservation is neither possible nor desirable from an ecological perspective, identify suitable receptor sites, guaranteed to be preserved and managed in perpetuity for the protection of the relocated species that will be utilized for the relocation of such rare or listed plants and animals made necessary by

unavoidable project impacts. Consistent use of the site by endangered species, or documented endangered species habitat on-site shall be preserved on-site.

- 3.4.8 Remove invasive exotics from all Natural Resources of Regional Significance and associated buffer areas. Require the continued regular and periodic maintenance of areas that have had invasive exotics removed.
- 3.4.9 Required maintenance shall insure that re-establishment of the invasive exotic does not occur.

#### **Strategic Regional Goal**

- 3.8 Enhance and preserve natural system values of South Florida's shorelines, estuaries, benthic communities, fisheries, and associated habitats, including but not limited to, Florida Bay, Biscayne Bay and the coral reef tract.

#### **Regional Policies**

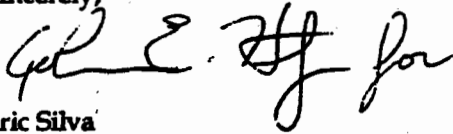
- 3.8.1 Enhance and preserve natural shoreline characteristics through requirements resulting from the review of proposed projects and in the implementation of ICE, including but not limited to, mangroves, beaches and dunes through prohibition of structural shoreline stabilization methods except to protect existing navigation channels, maintain reasonable riparian access, or allow an activity in the public interest as determined by applicable state and federal permitting criteria.
- 3.8.2 Enhance and preserve benthic communities, including but not limited to seagrass and shellfish beds, and coral habitats, by allowing only that dredge and fill activity, artificial shading of habitat areas, or destruction from boats that is the least amount practicable, and by encouraging permanent mooring facilities. Dredge and fill activities may occur on submerged lands in the Florida Keys only as permitted by the Monroe County Land Development Regulations. It must be demonstrated pursuant to the review of the proposed project features that the activities included in the proposed project do not cause permanent, adverse natural system impacts.
- 3.8.3 As a result of proposed project reviews, include conditions that result in a project that enhances and preserves marine and estuarine water quality by:
  - a) improving the timing and quality of freshwater inflows;
  - b) reducing turbidity, nutrient loading and bacterial loading from wastewater facilities and vessels;
  - c) reducing the number of improperly maintained stormwater systems; and
  - d) requiring port facilities and marinas to implement hazardous materials spill plans.
- 3.8.4 Enhance and preserve commercial and sports fisheries through monitoring, research, best management practices for fish harvesting and protection of nursery habitat and include the resulting information in educational programs throughout the region. Identified nursery habitat shall be protected through the inclusion of suitable habitat protective features including, but not limited to:
  - a) avoidance of project impacts within habitat area;
  - b) replacement of habitat area impacted by proposed project; or
  - c) improvement of remaining habitat area within remainder of proposed project area.

Col. Joseph R. Miller  
August 15, 2000  
Page 4

- 3.8.5 Enhance and preserve habitat for endangered and threatened marine species by the preservation of identified endangered species habitat and populations. For threatened species or species of critical concern, on-site preservation will be required unless it is demonstrated that off-site mitigation will not adversely impact the viability or number of individuals of the species.

Thank you for the opportunity to comment. We would appreciate being kept informed on the progress of this project. Please do not hesitate to call if you have any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric Silva", followed by a stylized flourish.

Eric Silva  
Senior Planner

ES/cp





DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
WASHINGTON, D.C. 20314-1000

31 JUL 2000

REPLY TO  
ATTENTION OF:

Honorable Carrie P. Meek  
U.S. House of Representatives  
Washington, D. C. 20515

Dear Ms. Meek:

Reference your letter dated July 25, 2000, and our telephone conversation of July 28, 2000, regarding local interest in restoration of the historic beach area on Virginia Key, Florida, a coastal barrier island in Miami, Florida.

As you are aware, the United States Army Corps of Engineers, Jacksonville District, was already involved in a 905(b) preliminary assessment of shoreline and upland environmental conditions on Virginia Key. The draft report is scheduled to be submitted for review in the next few days and will recommend Federal participation in shoreline and upland environmental restoration efforts at this site.

I am pleased to report that preliminary information reviewed by my staff supports the Jacksonville District's draft recommendation, and we anticipate quick approval for initiation of detailed design and construction efforts. We are also pleased that Miami-Dade County has indicated their interest in being the local sponsor for this project.

The recommended plan of improvements includes shoreline improvements consisting of granite and timber groins and placement of approximately 80,000 cubic yards of beach sand to restore and protect Virginia Key where beach erosion has been accelerated due to previous Federal improvements to the Port of Miami. Shoreline improvements, as mitigation for negative impacts of previous harbor improvements, are authorized under our existing Continuing Authorities Program, Section 111.

Under Section 111 authority, preparation of the required feasibility report and other design studies are a 100 percent Federal cost for the first \$100,000, with the balance being cost shared 50 percent Federal and 50 percent local. For construction, the local sponsor will be responsible for all lands and easements while the Federal Government will be responsible for all construction costs. Preparation of the feasibility report and construction plans and specifications is forecast to take 12 months and cost approximately \$300,000. The preliminary construction cost estimate is about \$4 million. We anticipate awarding the construction contract in late Fiscal Year (FY) 2001, provided that funds are available and significant permit issues involving seagrasses and turtle nesting are resolved without restrictions on the timing of construction activities. Approximately \$300,000 in Federal funds is required in FY 2001 to prepare the feasibility report, prepare construction plans and specifications, and award the construction contract.

Also recommended are upland environmental restoration improvements on Virginia Key. About 50 to 100 acres of the island were previously used for dredged material disposal during earlier Federal improvements to the Port of Miami. As mitigation for previous negative impacts, the 905(b) report will recommend removal of invasive exotic plants and restoration of natural wetlands and native coastal plant communities on 150 to 200 acres of the Virginia Key Beach Park area owned by the city of Miami. These upland environmental improvements are authorized under our existing Continuing Authorities Program, Section 1135.

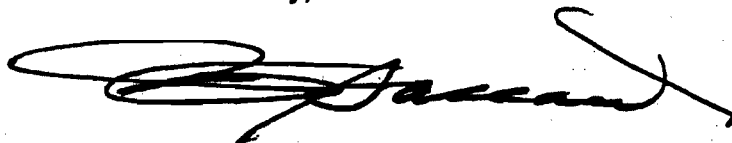
Under the terms of Section 1135, the local sponsor is required to cost share both design and construction. The total project cost will be shared 75 percent Federal and 25 percent non-Federal and includes preparation of an Environmental Restoration Report and construction plans and specifications, credit to the local sponsor for all required lands and easements, and project construction costs. Preparation of the required Environmental Restoration Report and construction plans and specifications is forecast to require 24 months, cost approximately \$600,000, and will be completed using 100 percent Federal funds. Local contributions are not required until the start of construction. We anticipate awarding the construction contract in late FY 2002. The preliminary construction cost estimate is about \$6 million, so Federal and non-Federal costs will be about \$4.5 million and \$1.5 million, respectively. Approximately \$300,000 in Federal funds is required in FY 2001 to initiate the Environmental Restoration Report.

Section 1135 also authorizes inclusion of recreation features up to 10 percent of project cost with costs shared 50 percent Federal and 50 percent non-Federal. This is important to local interests working to preserve historic recreation features at Virginia Key Beach Park.

This project provides a good example of the value of the Continuing Authorities Program as no new legislation is required to authorize the recommended Virginia Key improvements. However, implementation will depend on availability of funding. Historically, funding for this program has been very limited and competition for available funds has increased in recent years. In recognition of this, Congress has identified specific projects in various appropriations bills to ensure funds are made available for those projects.

The Corps looks forward to working with you on the Virginia Key project. If you need additional information on this project or another Corps effort, please feel free to contact me or my staff.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe N. Ballard", with a long horizontal stroke extending to the right.

Joe N. Ballard  
Lieutenant General, U.S. Army  
Commanding

South  
Florida  
Regional  
Planning  
Council



DD  
1

August 15, 2000

Col. Joseph R. Miller  
Department of the Army  
Jacksonville District Corps of Engineers  
PO Box 4970  
Jacksonville, Florida 32232-0019

RE: SFRPC #00-0759 - Response to a request for comments on the expedited reconnaissance study for the combined shore protection and environmental restoration at the Virginia Key Beach Park, U.S. Department of the Army, Miami-Dade County.

Dear Mr. Miller:

We have reviewed the above-referenced project and have the following comments:

- Beaches and dune systems are identified as natural resources of regional significance in the *Strategic Regional Policy Plan for South Florida*. Council staff supports the implementation of beach renourishment projects for the purposes of providing storm protection for upland property, restoring dunes and maintaining eroding beaches. Staff supports the use of buffer zones to protect these important resources.
- The use of groins and other hard coastal protection structures may adversely impact benthic resources and deprive downdrift shorelines of sand. Sand movement and downdrift erosion should be monitored on a region wide basis to ensure the livelihood of wildlife habitats and the stability of renourished areas. All actions should be consistent with the goals and policies of the Miami-Dade County comprehensive plan.
- In addition, the permit application indicates that the project may impact sea turtles and essential fish habitat. Staff recommends that, if the proposed actions are implemented, 1) impacts to the natural systems be minimized to the greatest extent feasible and 2) the permit grantor determine the extent of sensitive marine life and vegetative communities in the vicinity of each project and require protection and or mitigation of disturbed habitat. These guidelines will assist in reducing the cumulative impacts to native plants and animals, wetlands and deep water habitat and fisheries that the goals and policies of the *Strategic Regional Policy Plan for South Florida* seek to protect.
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### **Strategic Regional Goal**

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### **Regional Policies**

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unavoidable project impacts. Consistent use of the site by endangered species, or documented endangered species habitat on-site shall be preserved on-site.

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#### Strategic Regional Goal

- 3.8 Enhance and preserve natural system values of South Florida's shorelines, estuaries, benthic communities, fisheries, and associated habitats, including but not limited to, Florida Bay, Biscayne Bay and the coral reef tract.

#### Regional Policies

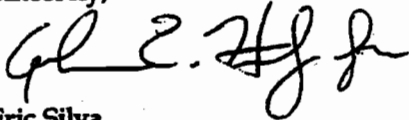
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  - c) improvement of remaining habitat area within remainder of proposed project area.

**Col. Joseph R. Miller**  
**August 15, 2000**  
**Page 4**

**3.8.5 Enhance and preserve habitat for endangered and threatened marine species by the preservation of identified endangered species habitat and populations. For threatened species or species of critical concern, on-site preservation will be required unless it is demonstrated that off-site mitigation will not adversely impact the viability or number of individuals of the species.**

**Thank you for the opportunity to comment. We would appreciate being kept informed on the progress of this project. Please do not hesitate to call if you have any questions or comments.**

**Sincerely,**

A handwritten signature in black ink, appearing to read "Eric Silva", written over a horizontal line.

**Eric Silva**  
**Senior Planner**

**ES/cp**

**cc: Ralph Cantral, FCMP**  
**Jean Evoy, Miami-Dade County DERM**





**DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
P. O. BOX 4870  
JACKSONVILLE, FLORIDA 32232-0019**

REPLY TO  
ATTENTION OF

**JUL 24 2000**

**Planning Division  
Environmental Branch**

**TO WHOM IT MAY CONCERN:**

The Jacksonville District, U.S. Army Corps of Engineers, has initiated a Section 905(b) Expedited Reconnaissance Study for combined shore protection and environmental restoration at Virginia Key Beach Park in Dade County, Florida. The enclosed study description is provided for your information.

Sincerely,

  
James C. Duck  
Chief, Planning Division

Enclosure

## **Section 905(b) Expedited Reconnaissance Study**

### **Shore Protection and Environmental Restoration Virginia Key Beach Park Dade County, Florida**

#### **Study Description**

- 1. Location.** The study area is located within the boundaries of Virginia Key Beach Park on Virginia Key in Dade County, Florida. Virginia Key is a barrier island located south of Fisher and north of Key Biscayne with the Atlantic Ocean to the east and Biscayne Bay to the west (Refer to Figure 1).
- 2. Reconnaissance Study Authority.** This study is authorized under the authority for the Biscayne Bay Feasibility Study, which was authorized by Congress in 1982. The study was requested in a letter dated April 14, 2000 from U.S. Representative Carrie P. Meek, Congressional District 17.
- 3. Improvements Considered.** Several potential alternatives for shore protection are being considered. These alternatives include constructing rock groins perpendicular to the shoreline, restoring some of the existing timber groins and removing the remaining timber groins, constructing a shore parallel breakwater, and/or placing beach fill along the eroding shoreline. Alternatives being considered for environmental restoration include removing exotic vegetation from wetland and upland sites and restoring with native vegetation, restore tidal flushing to areas as appropriate, create beach dune habitat, and provide recreational features such as pedestrian bridges, dune crossovers, boardwalks, interpretive signage and swimming buoys.
- 4. Study Purpose.** The purpose of the Reconnaissance Study is to determine if there is a Federal interest in providing shore protection and environmental restoration on Virginia Key, determine if there are feasible alternatives for shore protection and environmental restoration, and determine if further action is recommended.

**Enclosure**

# VIRGINIA KEY BEACH PARK

## RECONNAISSANCE STUDY

09-01-99

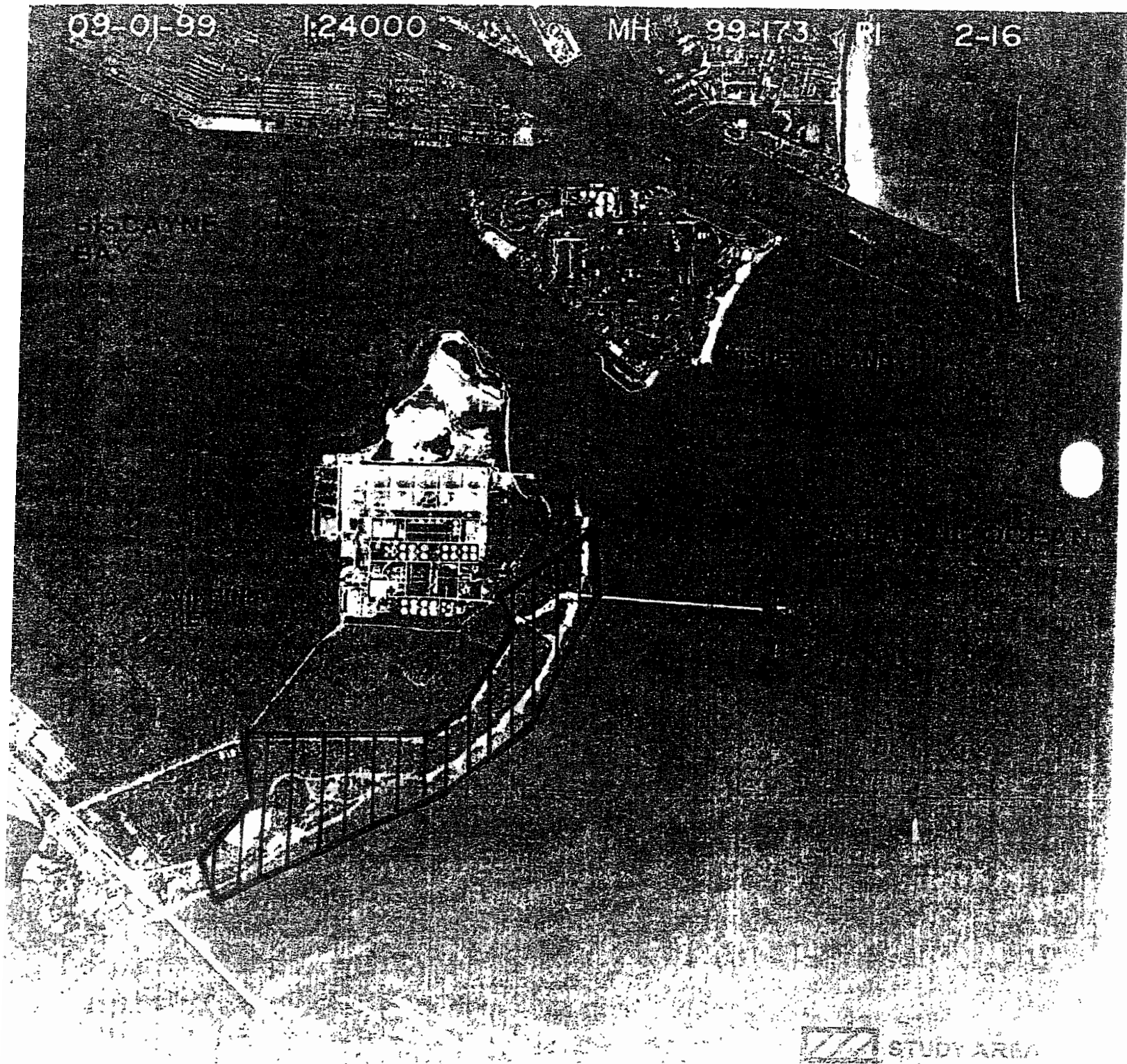
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JUL 20 2000

Planning Division  
Environmental Branch

Mr. Jay Slack  
U.S. Fish and Wildlife Service  
South Florida Ecosystems Office  
Post Office Box 2676  
Vero Beach, Florida 32961-2676

Dear Mr. Slack:

At the request of U.S. Representative Carrie P. Meek, the Jacksonville District, U.S. Army Corps of Engineers (Corps), has initiated a Section 905(b) Expedited Reconnaissance Study for shore protection and environmental restoration at Virginia Key Beach Park in Dade County, Florida. A brief description of the study is enclosed. The purpose of the study is to determine if there is a Federal interest in providing shore protection and environmental restoration at Virginia Key Beach Park, determine if there are feasible alternatives for improvements, and determine if further action is recommended.

The Corps would appreciate your assistance with identifying fish and wildlife resources, including threatened and endangered species and critical habitat, that are present within the project area and adjacent areas that should be considered while investigating potential improvements at Virginia Key Beach Park. Please provide us any information that you have or advise us of studies or information that we may obtain from other agencies or parties.

We are also inviting you to participate in the development of the Project Study Plan (PSP) should the Reconnaissance Study conclude with a recommendation to continue by moving into the feasibility study phase. This would include identifying detailed environmental studies or analysis that would be conducted during the feasibility phase.

-2-

Please provide the requested information by September 22, 2000. If you need additional information or have any questions about the study, please contact Mr. Mike Dupes at 904-232-1689.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure

bcc:

CESAJ-DP-I (Landers)  
CESAJ-PD-PN (White, Granat)

MD  
Dupes/CESAJ-PD-ER/1689 *sw*  
Dugger/CESAJ-PD-ER *1/7*  
Schmidt/CESAJ-PD-E  
Schmidt/CESAJ-PD-PN  
Strain/CESAJ-PD-P  
Landers/CESAJ-DP-I  
Duck/CESAJ-PD

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JUL 20 2000

Planning Division  
Environmental Branch

Dr. William T. Hogarth  
Regional Administrator  
Southeast Regional Office  
National Marine Fisheries Service  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

Dear Dr. Hogarth:

At the request of U.S. Representative Carrie P. Meek, the Jacksonville District, U.S. Army Corps of Engineers (Corps), has initiated a Section 905(b) Expedited Reconnaissance Study for shore protection and environmental restoration at Virginia Key Beach Park in Dade County, Florida. A brief description of the study is enclosed. The purpose of the study is to determine if there is a Federal interest in providing shore protection and environmental restoration at Virginia Key Beach Park, determine if there are feasible alternatives for improvements, and determine if further action is recommended.

The Corps would appreciate your assistance with identifying fish and wildlife resources, including essential fish habitat, threatened and endangered species, and critical habitat, that are present within the project area and adjacent areas that should be considered while investigating potential improvements at Virginia Key Beach Park. Please provide us information that you have or advise us of studies or information that we may obtain from other agencies or parties.

We are also inviting you to participate in the development of the Project Study Plan (PSP) should the Reconnaissance Study conclude with a recommendation to continue by moving into the feasibility study phase. This would include identifying detailed environmental studies or analyses that would be conducted during the feasibility phase.



-2-

Please provide the requested information by September 22, 2000. If you have any questions about the study or need additional information, please contact Mr. Mike Dupes at 904-232-1689.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure

Copy Furnish:  
Mike Johnson, National Marine Fisheries Service  
11420 Kendall Dr., Miami, FL 33176

Mark Thompson, National Marine Fisheries Service  
3500 Delwood Beach Road, Panama City, FL 32407

bcc:  
CESAJ-DP-I (Landers)  
CESAJ-PD-PN (White, Granat)

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Schmidt/CESAJ-PD-PN  
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Landers/CESAJ-DP-I  
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**Section 905(b) Expedited Reconnaissance Study**

**Shore Protection and Environmental Restoration  
Virginia Key Beach Park  
Dade County, Florida**

**Study Description**

- 1. Location.** The study area is located within the boundaries of Virginia Key Beach Park on Virginia Key in Dade County, Florida. Virginia Key is a barrier island located south of Fisher and north of Key Biscayne with the Atlantic Ocean to the east and Biscayne Bay to the west (Refer to Figure 1).
- 2. Reconnaissance Study Authority.** This study is authorized under the authority for the Biscayne Bay Feasibility Study, which was authorized by Congress in 1982. The study was requested in a letter dated April 14, 2000 from U.S. Representative Carrie P. Meek, Congressional District 17.
- 3. Improvements Considered.** Several potential alternatives for shore protection are being considered. These alternatives include constructing rock groins perpendicular to the shoreline, restoring some of the existing timber groins and removing the remaining timber groins, constructing a shore parallel breakwater, and/or placing beach fill along the eroding shoreline. Alternatives being considered for environmental restoration include removing exotic vegetation from wetland and upland sites and restoring with native vegetation, restore tidal flushing to areas as appropriate, create beach dune habitat, and provide recreational features such as pedestrian bridges, dune crossovers, boardwalks, interpretive signage and swimming buoys.
- 4. Study Purpose.** The purpose of the Reconnaissance Study is to determine if there is a Federal interest in providing shore protection and environmental restoration on Virginia Key, determine if there are feasible alternatives for shore protection and environmental restoration, and determine if further action is recommended.

**Enclosure**

# VIRGINIA KEY BEACH PARK

## RECONNAISSANCE STUDY

69-0199

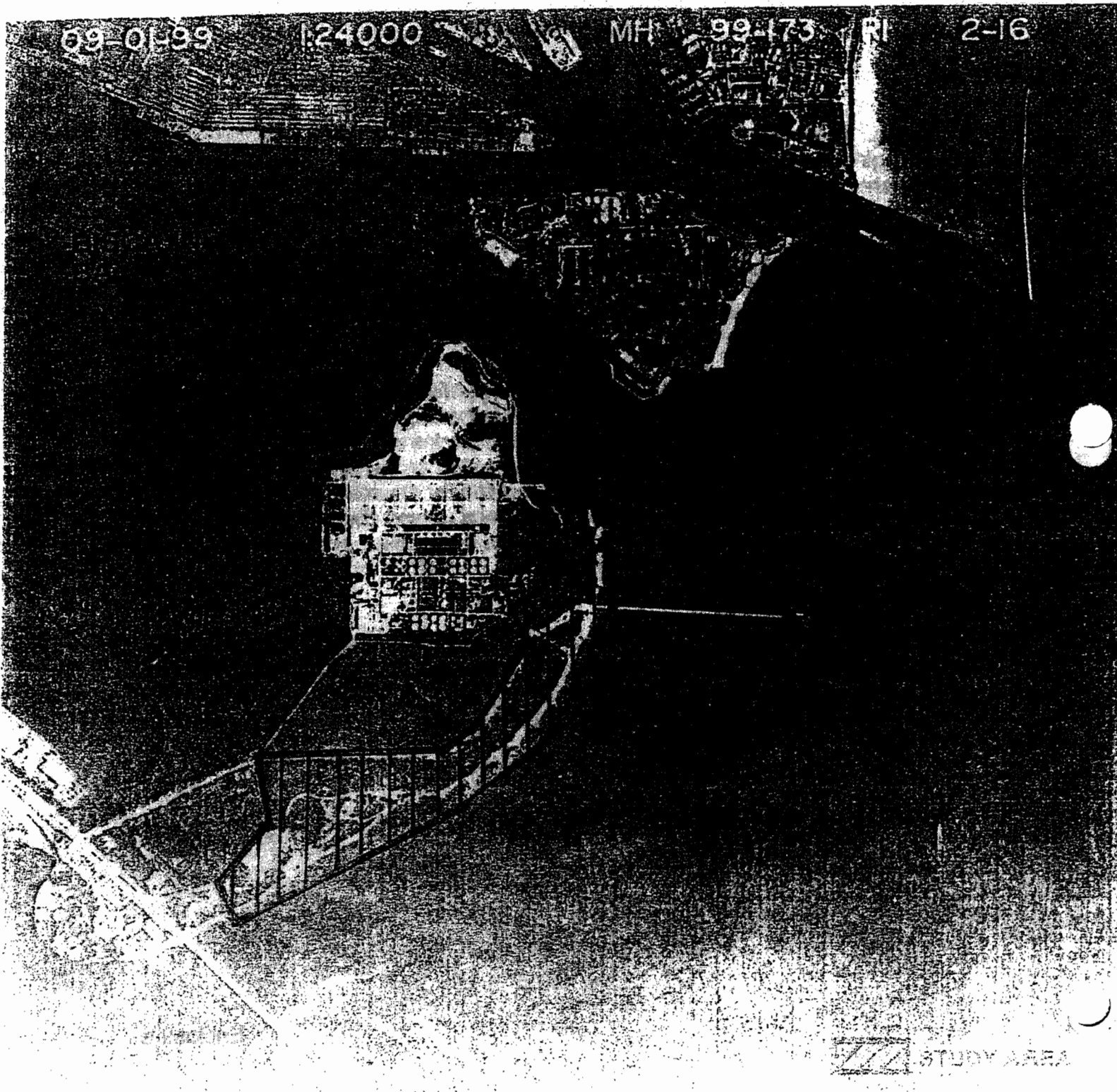
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STUDY AREA

Planning Division  
Environmental Branch

JAN 26 2001

Mr. James J. Slack  
South Florida Field Office  
U.S. Fish and Wildlife Service  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960-3559

Dear Mr. Slack:

This is with reference to the Virginia Key Section 111 Shore Protection and Section 1135 Environmental Restoration Projects, Dade County, Florida. Enclosed is a Scope of Work (SOW) and Cost Estimate for your office to prepare a Fish and Wildlife Coordination Act Reports for each project.

Please sign the SOW and return a copy to this office and process the enclosed MIPR to transfer funds.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure

*MD* Dupes/CESAJ-PD-ER/1689/als 1/23/01  
*MD* Dugger/CESAJ-PD-ER  
*MD* Smith/CESAJ-PD-E  
*MD* Schmidt/CESAJ-PD-PN  
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*MD* Duck/CESAJ-PD

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DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
P. O. BOX 4870  
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO  
ATTENTION OF

Planning Division  
Environmental Branch

FEB 15 2002

Mr. James J. Slack  
U.S. Fish and Wildlife Service  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960-3559

Dear Mr. Slack:

The U.S. Army Corps of Engineers (Corps) in partnership with the City of Miami are proposing to restore and/or enhance the environment of certain areas on Virginia Key, Dade County, Florida. Restoration efforts would include the removal of invasive exotic vegetation from native plant communities, such as tropical hardwood hammock and coastal strand. Indigenous species of trees, shrubs and herbaceous vegetation would be planted in the larger areas where the dominant exotics had been eliminated. Interspersed with some of the tropical hardwood hammocks are remnant ditches, isolated depressions that may at times be wet, as well as several fresh or brackish water ponds. To supplement these landscape features, a freshwater pond with an adjacent wetland fringe is also being planned.

Enclosed is a Biological Assessment pursuant to Section 7 (a) of the Endangered Species Act. The Corps has determined that the proposed action would not affect the West Indian manatee, bald eagle, or wood stork, but may affect sea turtles and the American crocodile.

Please provide your Biological Opinion as specified in Section 7 (b) (1) of the Endangered Species Act. If you have questions or need additional information, please contact Mr. Paul Stodola at 904-232-3271.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure

**ENDANGERED SPECIES ACT  
BIOLOGICAL ASSESSMENT  
PROPOSED ENVIRONMENTAL RESTORATION  
VIRGINIA KEY  
DADE COUNTY, FLORIDA**

1. **Project Description.** Environmental restoration of selected areas on Virginia Key would be accomplished by removing exotic vegetation from approximately 83.13 acres of tropical hardwood hammock. Scattered throughout several of these hammock areas are remnant water-filled ditches, isolated depressions that may at times be wet, and fresh or brackish-water ponds. Exotic vegetation would also be removed from an estimated 6.9 acres of coastal strand and 2.37 acres of a fairly distinctive wet area. A 2.0-acre freshwater pond with a wetland fringe is also being planned. All exotics would be selectively cut in order to preserve as much of the remaining native vegetation as possible. Heavy machinery may be used to clear those parts of the island where exotic vegetation has become especially dominant. Native vegetation would be planted throughout much of the restoration area where exotics have been eliminated. The project is tentatively scheduled to begin in the fall of 2002.

Specific areas identified for restoration include the following (please refer to Figure 1):

- a. **Area 1. Coastal Strand Community;** approximately 3.08 acres. Exotic species of plants such as Australian pine, inkberry, and Brazilian pepper would be selectively removed and native coastal strand species planted.
- b. **Area 1A. Open Space, Pond, remnant Tropical Hardwood Hammock;** approximately 39.55 acres. The currently vegetated portion of Area 1A, an estimated 18 acres, would be selectively cleared of Brazilian pepper and Australian pine and native tropical hardwood species planted. Open space would remain for parking and other uses, but some open areas may be landscaped with native vegetation.
- c. **Area 2. Tropical Hardwood Hammock, Wet Areas, Open Space;** approximately 30.82 acres. This area is heavily infested with Australian pine and Brazilian pepper. An estimated 22.55 acres, the currently vegetated portion, would be selectively cleared of exotics and native tropical hardwood species planted. Area 2 is interspersed with ditches, some of which are currently holding water, as well isolated depressions that may at times be wet. The



open area would remain for parking and other uses, but may be landscaped with native vegetation to a limited extent.

- d. Area 2A. Freshwater Pond with Fringe Wetland; approximately 2.07 acres. A freshwater pond with a fringe wetland would be constructed in an area dominated by exotic vegetation. Construction debris, primarily rock and fill dirt, was also observed in this location and would be removed. The pond would be constructed with a 10:1 slope and a maximum excavation depth of 0.0 feet above msl. Hydric vegetation is expected to colonize the perimeter of the pond.
- e. Area 3. Tropical Hardwood Hammock; approximately 9.03 acres. This area is also heavily infested with Australian pine, Brazilian pepper, as well as seaside mahoe. The exotics would be selectively cleared and native tropical hardwood species planted. This area is interspersed with ditches that are currently holding water, isolated depressions that may at times be wet, and a fresh or brackish water pond.
- f. Area 4. Coastal Strand Community; approximately 3.82 acres. Exotics such as Australian pine, inkberry, and Brazilian pepper would be selectively removed and native coastal strand species would be planted.
- g. Area 5. Wet Area; approximately 2.37 acres. This area consists mainly of isolated depressions that may at times be wet as well as water-filled ditches. Exotic vegetation comprises a large part of the dense canopy. The exotics would be selectively removed and native vegetation planted.
- h. Area 6. Tropical Hardwood Hammock; approximately 19.91 acres. Exotics have been mostly cleared from this area. Additional natives would be planted in this location to supplement the plantings that have already occurred.
- i. Area 7. Tropical Hardwood Hammock; approximately 11.36 acres. Exotics consisting primarily of Brazilian pepper and Australian pine would be selectively cleared and native hardwood hammock species planted.
- j. Areas 8 and 9. Tropical Hardwood Hammock; approximately 0.83 and 2.16 acres respectively. These areas would be selectively cleared of exotic vegetation.

2. **Restoration Alternatives Eliminated from further Analysis.** The following restoration alternatives, some of which were described in the 905b report, have been eliminated from further analysis:
- a. Placement of sand on the beach along the eastern shoreline of Virginia Key, north of the proposed Section 111 project. This alternative was eliminated because of the density of nesting sea turtles at this location.
  - b. Restoration of the mangrove community adjacent to the mulching operation and sewage treatment plant. This area was eliminated because it was always a low priority with the local sponsor and because NOAA expressed an interest in using this area for mitigation purposes.
  - c. Increasing the hydrologic connection between the above mangrove community with a remnant wetland to the south by installing a culvert. This alternative was eliminated because of difficulties in placing the culvert under an existing road that has several utility lines underneath it.
  - d. Connecting Area 3 with the coastline by ditch or culvert. Eliminated due to difficulties in keeping the connection open.
3. **Project Need or Opportunity.** The proposed restoration would occur within the 132-acre city park on Virginia Key. A significant portion of the park, an estimated 77 acres, is presently under consideration for designation as a National Historic Area. The environmental restoration work would be performed in concert with the expected designation. This would be important to local entities that are interested in protecting historical as well as environmental characteristics of the island. The proposed action would not only complement the designation as a National Historic Area, but would certainly enhance local fish and wildlife resources by restoring biologically diverse habitat types that have significantly declined in the greater Miami area.
4. **Project Authority.** Pursuant to Section 1135 of the Water Resources Act of 1986, as amended, the Corps has the authority to make modifications in the structures and operations of water resources projects, constructed by the Corps, if determined that the modifications are: (1) feasible and consistent with the authorized project purposes, and (2) will improve the quality of the environment in the public interest. The primary benefits

from Section 1135 projects must be associated with improvements to fish and wildlife resources. In this case, approximately 50-100 acres of Virginia Key were previously impacted when used for dredged material disposal during federal improvements to the Port of Miami.

5. **Identification of Listed Species.** Federally listed species which may occur in the vicinity of the proposed work and are under the jurisdiction of the U.S. Fish and Wildlife Service are: loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), hawksbill sea turtle (*Eretomochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), American crocodile (*Crocodylus acutus*), West Indian manatee (*Trichechus manatus*), bald eagle (*Haliaeetus leucocephalus*) and the wood stork (*Mycteria americana*).

The loggerhead sea turtle was listed as a federally threatened species on July 28, 1978. Approximately 80 % of loggerhead nesting in Florida occurs in six counties (Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward) (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a). The nesting season of this species typically occurs between late April through August, with most nesting occurring in June and July and occasional nesting occurring in September. Incubation takes 50-75 days depending on nest temperature (Dodd 1992). According to the Florida Fish and Wildlife Conservation (FWC) sea turtle nesting database, the first nest date and last nest date recorded for Virginia Key were 05/03/95 and 08/15/96 respectively. The following table summarizes sea turtle (mostly loggerhead) nesting activity on Virginia Key from 1991 through 2000. The overwhelming majority of these nests were recorded from the northeast shoreline of the island.

**SEA TURTLE NESTING DATA FOR VIRGINIA KEY, 1991-2000.**

YEAR	NESTS #	FALSE CRAWLS #
1991	37	75
1992	14	31
1993	40	89
1994	52	100
1995	68	110
1996	53	69
1997	62	175
1998	68	132
1999	64	78
2000	80	192

Source: Ms. Wendy Teas, National Marine Fisheries Service

The green sea turtle was listed as federally endangered on July 28, 1978. In Florida, this species also nests along the east coast of Florida and principally in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). Nesting in Florida typically begins in May and continues through September (Erhart and Witherington 1992). FWC records, 1993-1998, indicate that this species was not identified as nesting on Virginia Key.

The leatherback sea turtle was listed as an endangered species on June 2, 1970. This species is known to regularly nest, albeit in small numbers, along the east coast of Florida (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992). Pritchard (1992) reported that leatherbacks nest most frequently in Florida along the mid-peninsula area of the east coast. FWC records, between 1993-1998, indicate that nesting of this species was not observed on Virginia Key.

Listed as an endangered species on June 2, 1970, the hawksbill sea turtle is a rare nester on southeastern beaches with only 1-2 nests recorded annually on Florida beaches (Lund 1985; McMurtray and Richardson 1985; Conley and Hoffman 1986). Nesting has been recorded for the months of June, July, August, and October and from Volusia, Martin, and Dade Counties (Lund 1985; McMurtray and Richardson 1985). FWC records indicate that one hawksbill nest was identified on Virginia Key in 1995.

The Kemp's ridley sea turtle was listed as endangered on December 2, 1970. Adult ridleys are generally believed to be restricted to the Gulf of Mexico, with only a few nests of this species being recorded on the east coast of Florida (Ogren 1992). FWC records, between 1993-1998, indicate that nesting of this species was not observed on Virginia Key.

The American crocodile was listed as an endangered species in 1975 and critical habitat was established for this species in 1979. According to the recovery plan for the crocodile, the designated critical habitat for this species does not include Virginia Key (U.S. Fish and Wildlife Service 1999). However, crocodiles have been observed in Bill Baggs/Cape Florida State Park on Key Biscayne (G. Milano, Department of Environmental Resource Management-Dade County, 2002, personal communication). They may occur on Virginia Key but have not been observed during recent site inspections.

The West Indian manatee was listed as an endangered species in 1967 and critical habitat was established for

this species in 1976. This species commonly occurs in Biscayne Bay (Hartman 1974; Powell and Rathbun 1984).

The bald eagle was listed as federally threatened on July 12, 1995. This species, as well as its nests, have not been observed on Virginia Key. A search of the Florida Fish and Wildlife Conservation Commission bald eagle database indicates no recent nests have been observed on the island.

Listed as endangered on February 28, 1984, the wood stork has been known to breed in the Miami-Dade County area (U.S. Fish and Wildlife Service 1999). The wood stork may at times use the aquatic habitats on the island for feeding purposes. However, Department of Environmental Resource Management and Corps biologists have not observed the species or potential nesting or roosting sites on Virginia Key.

6. **Discussion of Potential Impacts to Listed Species.** The Corps is proposing to remove exotic vegetation from Virginia Key's coastal strand community that may be used by, or at least potentially lies in close proximity to, nesting sea turtles. Vehicular access to this particular area from the island's interior as well as from the beach would facilitate the elimination of exotic trees and shrubs. This action may affect nesting sea turtles. As previously stated, Virginia Key has isolated fresh or brackish water ponds that may be used by the American crocodile. Exotic vegetation can be found along the perimeter of each pond and would be removed as part of the restoration effort. Therefore, the Corps has determined that this action may affect the American crocodile. The manatee is known to occur in Biscayne Bay. However, no restoration work is being planned in the water. The ditches and isolated ponds on the island are not accessible to the manatee. For this reason, the Corps has determined that the proposed project would have no effect on this species. The wood stork and bald eagle may occasionally be seen on or near Virginia Key. However, these species were not observed during multiple site visits this past year and there are no recent records of eagle nests on the island. This action should have no effect on these species.
7. **Efforts to Eliminate Potential Impacts on Listed Species or Critical Habitat.** Restoration activities would be kept under surveillance, management, and control to minimize interference with, disturbance of, or damage to wildlife resources. Prior to the commencement of construction the contractor would be required to instruct all personnel associated with the project that endangered species could be in the area, the need to avoid

collisions with them, and the civil and criminal penalties for harming, harassing or killing them.

The Corps has determined that all of the following alternative methods for removing exotic vegetation from the coastal strand community would greatly reduce potential adverse impacts to nesting sea turtles:

Alternative 1. If work takes place during the sea turtle nesting season (April 1 - October 31), the beach would be monitored for nesting activity according to the Biological Opinion of the U.S. Fish and Wildlife Service. Monitoring would begin at least 65 days prior to commencement of work. Any located nests would be appropriately marked and avoided by the contractor.

Alternative 2. Work vehicles would not be allowed on the beach during the sea turtle nesting season. Entry into the coastal strand community would be from the island's interior only. Heavy machinery would not be used to remove exotics in this area, rather vegetation would be removed with hand held tools (i.e. chainsaws).

Alternative 3. No work of any kind would occur in the coastal strand community during the sea turtle nesting season. Removal of exotics in this area would be accomplished during the non-nesting season.

In order to minimize potential adverse impacts to the American crocodile, the contractor would be required to educate construction personnel using posters, videos, pamphlets, lectures, etc. on the following:

1. identification of the American crocodile, its habits, and protection under federal law;
2. instructions not to injure, harm, harass or kill this species.

Similar restoration efforts were performed within sight of the American crocodile at Bill Baggs State Park. The animals did not attempt to leave the area or appear to be stressed by the activity (G. Milano, Department of Environmental Resource Management-Dade County, 2002, personal communication). It is believed that the restoration efforts would enhance the habitat for this species as well as significantly improve the biological diversity of the entire island.



## References

- Conley, W.J. and B.A. Hoffman. 1986. Florida sea turtle nesting activity: 1979-1985. Florida Department of Natural Resources, St. Petersburg, Florida. 17 pp.
- Dodd, C.K. 1992. Loggerhead sea turtle. Pages 128-134 in P.E. Moler, editor. Rare and endangered biota of Florida. Volume III. Amphibians and reptiles. University Press of Florida, Gainesville, Florida.
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- McMurtray, J.D., and J.I. Richardson. 1985. A northern nesting record for the hawksbill turtle. Herp. Review 16(1):16-17.
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- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991b. Recovery plan for U.S. Population of green turtles (*Chelonia mydas*). National Marine Fisheries Service, Washington, D.C. 64pp.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery plan for U.S. Population of leatherback turtles (*Dermochelys coriacea*). National Marine Fisheries Service, Washington, D.C. 65pp.
- Ogren, L.H. 1992. Atlantic ridley turtle. Pages 100-104 in P.E. Moler, editor. Rare and endangered biota of Florida. Volume III. Amphibians and reptiles. University Press of Florida, Gainesville, Florida.

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Pritchard, P.W. 1992. Leatherback sea turtle. Pages 214-218 in P.E. Moler, editor. Rare and endangered biota of Florida. Volume III. Amphibians and reptiles. University Press of Florida, Gainesville, Florida.

U.S. Fish and Wildlife Service. 1999. American crocodile. Pages 4-505-4-528 in Multi-species recovery plan for south Florida.

U.S. Fish and Wildlife Service. 1999. Wood stork. Pages 4-393-4-428 in Multi-species recovery plan for south Florida.

### **APPENDIX 3 - PERTINENT CORRESPONDENCE**

## **APPENDIX 4 – HABITAT UNIT CALCULATION**

# **HABITAT UNIT CALCULATION**

## **SECTION 1135 ECOSYSTEM RESTORATION VIRGINIA KEY DADE COUNTY, FLORIDA**

### **IDENTIFICATION OF HABITAT TYPES**

Biologists from the Dade County Department of Environmental Resource Management (DERM), U.S. Fish and Wildlife Service (USFWS), and the U.S. Army Corps of Engineers conducted field investigations in order to identify existing habitat types within the Virginia Key study area. Those habitat types for which conditions would not be changed by the proposed restoration project, i.e. ruderal areas, were eliminated from further consideration. The following is a summary of the habitat types that would be restored:

#### ***Dunes/Coastal Strand***

Status: According to the Florida Natural Areas Inventory (1990) coastal strand, also known as coastal scrub and maritime thicket, is one of the most rapidly disappearing natural communities in Florida. Although it previously formed an almost continuous band along the Atlantic coast, it is now found only in isolated stretches because it is prime residential and resort property (Johnson and Barbour, 1990; Cox et al., 1994). This habitat type has the least amount of remaining acreage in the state (Cox et al., 1994). On Virginia Key, the dunes and coastal strand along the northern portion of the island have been adversely impacted by the construction of the dredged material management area. This habitat type has also been severely degraded along the eastern shoreline by the invasion of exotic plant species and erosion.

Project Objective: Restoration of the dunes and coastal strand habitat within the study area is expected to provide higher quality nesting habitat for sea turtles. This area would also provide the proper environment for the Federally endangered Beach Jacquemontia (*Jacquemontia reclinata*), which has been historically observed on Virginia Key. Coastal strand vegetation would also help stabilize the eroding shoreline. Beaches and dunes have been identified as natural resources of regional significance in South Florida Regional Planning Council's "Strategic Regional Policy Plan for South Florida"; enhancing and preserving natural system values of South Florida's shorelines is a strategic regional goal.

### ***Tropical Hardwood Hammock***

**Status:** Plant species typical of tropical hardwood hammocks have been identified within the study area such as Spanish stopper (*Eugenia foetida*), strangler fig (*Ficus aurea*), and mastic (*Mastichodendron foetidissimum*). Biscayne prickly ash (*Zanthoxylum coriaceum*), a State-listed endangered tree, has also been observed. This plant community has been severely degraded, however, and in some locations appears to have been almost completely replaced by exotic invasive vegetation such as Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*). Throughout south Florida, development has caused tropical hardwood hammocks to greatly decline (Snyder et al., 1990; Hartman 1992). It is considered to be one of the most rare and imperiled habitat types in the state, second only to coastal strand in remaining acreage (Johnson and Barbour, 1990; Cox et al., 1994). This community also contains some of the rarest plants and animals found in all of the United States (Layne, 1984; Snyder et al., 1990).

**Project Objective:** The proposed action would not only restore this rare plant community but would also provide higher quality habitat for many species of wildlife such as neo-tropical migrating birds and native land and tree snails. Protection and enhancement of upland habitats in areas like Virginia Key is a strategic regional goal in the South Florida Regional Planning Council's "*Strategic Regional Policy Plan for South Florida*." Newspaper articles and editorials have urged the City of Miami to protect Virginia Key's "unique and fragile natural environment."

### ***Pond with Fringe Wetlands***

**Status:** There are existing ponds with wetland fringes on Virginia Key. However, the proposed new pond would be different in having a relatively gentle slope allowing for marsh vegetation to establish itself. Wetland fringes along existing ponds have been degraded by invasive exotic vegetation.

**Project Objective:** The construction of the proposed pond and wetland fringe would diversify the existing habitats on Virginia Key by adding a significant marsh component. Wading birds as well as reptiles and amphibians would utilize this habitat. Depending on salinity levels, it may also provide drinking water for wildlife. Removal of exotic vegetation from existing pond areas would improve the wetland fringe habitat.

### ***Wetlands (Mangroves and Transitional Wetlands)***



**Status:** A high percentage of mangroves and other wetland communities have been lost along the lower east coast of Florida (Myers and Ewel, 1990). The northwestern portion of Virginia Key has been designated a Critical Wildlife Area and a substantial portion of this refuge is comprised of mangrove habitat. Small pockets of mangroves and transitional wetlands are scattered throughout the study area. However, a fairly significant stand of mangroves and transitional wetlands can be found within the "Mid-Key" portion of the island. This area has been degraded by invasive exotic vegetation.

**Project Objective:** Removal of exotic vegetation from the wetlands within the study area would provide higher quality habitat for aquatic life, colonial nesting birds, and other wildlife. The Biscayne Bay Partnership Initiative recognizes that regional mangrove habitat is in need of protection and restoration where possible.

### **CALCULATION OF HABITAT UNITS**

Biologists from DERM and the Corps delineated each habitat type by using recent aerial photographs and ground-truthing. These results were coordinated with the USFWS. A scaled map of the study area was then created using an aerial photograph, which depicts the habitat type boundaries. Acreages were determined from the scaled map using Micro-station. All three agencies participated in assigning each habitat type a "habitat quality rating" on a scale of 0-1 (0 being lowest value, 1 being highest value). The agencies reached a consensus on the appropriate rating for each habitat type. Habitat units were calculated for the existing conditions and each of the alternatives by multiplying the acreage for each habitat type by the habitat quality rating. The following table summarizes the calculated habitat units for each habitat type.

## INDEX

### —A—

aesthetics, 12, 19  
Aesthetics, 33, 35  
Affected Environment, 4, 9  
AFFECTED ENVIRONMENT, 9  
AGENCY COORDINATION, 26  
Air Quality, 22, 40  
Alternative, 4, 9, 35  
ALTERNATIVE 1, 15, 16  
ALTERNATIVE 1-NO ACTION, 4  
ALTERNATIVE 2A-lower key restoration with new pond  
and fringe wetland, 4  
ALTERNATIVE 2-lower key restoration, 4  
Alternative 3, 18  
ALTERNATIVE 3-middle key restoration, 4  
Alternative 4, No Action, 19  
ALTERNATIVE 4, NO ACTION, 13  
ALTERNATIVE 4-upper key restoration, 4  
Alternative Comparison, 18  
Alternatives, 4, 9, 13, 19, 20  
ALTERNATIVES, 4  
ALTERNATIVES ELIMINATED FROM DETAILED  
EVALUATION, 5  
American Crocodile, 10, 13, 14, 15, 16  
appropriation, 1  
Archeological, 38  
Artificial Reef, 23, 38

### —B—

Bald Eagle, 10, 13, 14, 15, 16  
beach jacquemontia, 10, 13  
BEACH JACQUEMONTIA, 14, 15, 16  
Benthic, 38  
Birds, 23  
Borrow Area, 39

### —C—

Clean Water Act, 22, 23, 35  
Coastal Barrier Resources, 23  
COASTAL STRAND, 11, 17  
COASTAL ZONE MANAGEMENT CONSISTENCY, 37  
COMMENTS RECEIVED, 26  
COMPARISON OF ALTERNATIVES, 5  
Consultation, 22, 23  
Coordination, 22  
County, 38  
cultural resources, 19  
Cultural Resources, 12

CUMULATIVE IMPACTS, 19

### —D—

DECISIONS TO BE MADE, 2  
Dunes, 38

### —E—

EA, 4, 22, 25, 26  
Economic, 39  
Effect, 38, 39  
Endangered, 21, 34, 35  
Endangered Species Act, 13  
Endangered Species Act-Section 7 Coordination, 3  
Enhance, 39  
Environmental Assessment, 2, 21  
ENVIRONMENTAL COMMITMENTS, 20  
Environmental Coordination, 3  
ENVIRONMENTAL EFFECTS, 13  
Erosion, 40

### —F—

Federal, 22, 38  
Fish, 23, 35, 38  
Fish and Wildlife, 22  
Fish And Wildlife coordination act report, 3  
Fish and Wildlife Resources, 11, 18  
FISH AND WILDLIFE RESOURCES, 11  
Flood Plain, 23

### —G—

GENERAL ENVIRONMENTAL EFFECTS, 13  
GENERAL ENVIRONMENTAL SETTING, 9

### —H—

Habitat, 35, 38, 39  
HABITAT UNIT CALCULATION, 42  
Hazardous, 40  
HAZARDOUS, TOXIC AND RADIOACTIVE WASTE,  
12  
Hazardous, Toxic, and Radioactive Waste, 19  
Historic, 35, 39  
Historic Preservation, 39

### —I—

Impact, 39, 40  
INDIRECT EFFECTS, 20

Infrastructure, 38  
Initial authorization, 1  
IRREVERSIBLE AND IRRETRIEVABLE  
COMMITMENT OF RESOURCES, 20  
Issues Eliminated from Detailed Analysis, 3  
Issues Evaluated in Detail, 3

—L—

LIST OF PREPARERS, 25  
LIST OF REVIEWERS, 25  
LOCAL SHORT-TERM USES AND  
MAINTENANCE/ENHANCEMENT OF LONG-  
TERM PRODUCTIVITY, 20  
Location, 1, 31, 32  
Loggerhead Sea Turtle, 9

—M—

Mitigation, 38

—N—

National Environmental Policy Act, 21  
National Marine Fisheries Service, 22  
Nesting, 38  
No Action, 6  
Nourishment, 23, 38, 39

—O—

Oil, 39, 40  
OWNERSHIP, 9

—P—

PERTINENT CORRESPONDENCE, 41  
Petroleum, 40  
Physical Effects, 32  
Preservation, 38, 39  
Project Authority, 1  
Project description, 2  
PROJECT LOCATION, 1  
PROJECT NEED OR OPPORTUNITY, 2  
PROJECT PURPOSE AND NEED, 1  
Public Hearing, 22, 23  
PUBLIC INVOLVEMENT, 26  
Purpose, 31

—R—

Recreation, 19, 22, 35, 39  
RECREATION RESOURCES, 12  
Reef, 23, 38

RELATED ENVIRONMENTAL DOCUMENTS, 2  
Renourishment, 22, 40  
Resources, 9, 20, 23, 38, 39, 40  
RUDERAL AREAS, 11

—S—

Safety, 38  
SCOPING AND ISSUES, 3  
Sea Grass, 38  
Sea Turtle Nesting, 38  
SEA TURTLES, 9, 13, 14, 15, 16  
Section 404, 22  
SECTION 404(B) EVALUATION, 30  
Section 905(B) (WRDA 86) Analysis, 1  
SHPO, 22, 39  
SITE DESCRIPTION, 9  
socio-economic, 19  
socio-economics, 12  
Solid Waste, 40  
State, 22, 23, 35, 38, 39  
State Historic Preservation, 22, 39  
Summary, 6

—T—

Threatened, 34  
threatened and endangered species, 13  
THREATENED AND ENDANGERED SPECIES, 9  
Transfer, 39  
TROPICAL HARDWOOD HAMMOCK, 10, 17  
Turtle, 38

—U—

U.S. Army Corps of Engineers, 20  
U.S. Environmental Protection Agency, 22  
U.S. Fish and Wildlife Service, 22  
UNAVOIDABLE ADVERSE ENVIRONMENTAL  
EFFECTS, 20  
Unique, 22, 38

—V—

Vegetation, 10, 17, 20

—W—

Water Quality, 19  
WATER QUALITY, 11  
Water Quality Certification, 3  
Water Resources, 39  
West Indian Manatee, 10, 13, 14, 15, 16  
wetlands, 11

**WETLANDS, 17**  
**Wildlife, 35, 38**

**Wood Stork, 10, 13, 14, 15, 16**

**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX A**

**Engineering**

**U.S. Army Engineer District**  
**Jacksonville, Florida**

# **APPENDIX A ENGINEERING ANALYSIS**

## **Virginia Key, Miami-Dade County, Florida Section 1135 Study**

### **INTRODUCTION**

#### **General**

The Virginia Key Section 1135 Environmental Restoration Study was performed at the request of the local sponsor in order to restore the native environmental habitat on Virginia Key in Dade County, Florida. Virginia Key is the middle island in a series of three barrier islands located south of the Miami Harbor Entrance Channel.

The 1135 study was performed in order to restore native habitat on land owned by the City of Miami (the local sponsor) which has been adversely impacted by prior local and Corps of Engineers projects. Land owned by the sponsor comprises Old County Park which is currently closed to the public. The recommended plan of improvement as developed in the Section 1135 study consists of several elements, including removal of non-native exotic vegetation and replanting areas of the island with native vegetation.

### **PROPOSED IMPROVEMENTS**

#### **Summary of Recommended Plan**

As was briefly discussed above, the recommended plan of improvement as developed in the Section 1135 study is to remove non-native vegetation and re-plant the area with native species. The removal and replanting of vegetation is discussed in detail in Appendix B, the Environmental Assessment, and in the main text of this Section 1135 Study, and will not be addressed in this Engineering Appendix

#### **Design of Freshwater Pond**

Details on the design of the freshwater pond from Alternative 2A, including geotechnical investigations and cost estimates, are available on request. These details are not given in this report due to the fact that the pond is not included in the recommended plan.

### **COST ESTIMATES**

#### **M-CASES**

The following pages contain detailed cost estimates for the recommended plan.



Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135

TIME 09:22:39  
TITLE PAGE 1

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Virginia Key 1135 ERR  
Recommended Plan

Designed By: CESAJ  
Estimated By: Tracy Leeser

Prepared By: Tracy Leeser

Preparation Date: 09/09/05  
Effective Date of Pricing: 10/01/05  
Est Construction Time: 198 Days

Sales Tax: 7.30%

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Release 5.31

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
PROJECT NOTES

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135

TIME 09:22:39  
TITLE PAGE 2

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Recommended Plan Cost Estimate

\*9/9/05 Scope of Work: Combination of Alternatives 2, 3, and 4 is the Recommended Plan, per e-mail from PD-PN (M. Schrader) dated 8/31/05.

\*9/9/05 To develop the recommended plan estimate I updated the fuel prices in the equipment database and escalated all costs to 10/1/05 levels. Fuel prices were updated using the following sources: Off-road diesel, quote from Lester's Fuel Service (9/2/05); regular gasoline and on-road diesel, AAA (9/7/05); electricity, DOE (www.doe.gov, 9/7/05). Escalation is calculated using yearly factors from EM 1110-2-1304. I used the factors for Fish and Wildlife Facilities and Recreation Facilities, as appropriate, and began escalation in FY 00, the date of the crews and labor databases used in the plan formulation estimate.

\*9/9/05: PED costs are provided by EN-DL, S&A by CO and Real Estate by RE-A. RE costs provided in an e-mail dated 9/7/05 from PD-PN (M. Schrader).

\*9/9/05: Adjusted home office overhead, field office overhead, profit and bond. HOOH matches audited rate for DACW17-03-R-0025. Applied subcontractors for clearing and grubbing and recreation. Applied no escalation or contingency to non-construction costs since these were provided to me as itemized estimates.

\*9/9/05: All notes below are valid unless they have been superseded by a note above.

Basis for estimates are as follows:

Appendix B of report sent 10/20/03 from PD.

Email from PD-PN 10/24/03 regarding disposition of exotics. Exotics will be chipped and composted on site to supplement mulch requirement. Assume mulch from exotics provides 15% of required mulch.

Email from PD-PN 10/20/03 regarding mulch requirements. Mulch is required for tropical hardwood hammock as 0.5 cy per tree and 0.25 cy per shrub. No mulch required for dune/coastal strand or wetlands plantings.

Costs escalated to assumed midpoint of construction as Oct 2005.

Contingency: 25%

No input for PED costs so a 10% flat rate was assumed.

S&A: 8%

Construction schedules:

Each alternative should include 1 growing season to allow plant materials to reach adequate size for installation.

For clearing and installation, allow 1 year for Alts. 2, 2A & 3 and 9 months for Alt. 4.

3/16/04, TTL: Updated Equipment Database area factors to match those recently published in EP 1110-1-8, Vol. 3, 31 July 03. Updated the gasoline cost per gallon to \$1.74, state average as reported in the Florida

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
PROJECT NOTES

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135

TIME 09:22:39  
TITLE PAGE 3

Times-Union on 3/10/04. Updated diesel cost per gallon (off-road use) to \$1.40, per e-mail message from B. Blake reporting quote for diesel.

3/16/04, TTL: In keeping with notes taken by S. Burch in meeting last week and meeting held this date with P. Stevenson, PD-PN, made the following changes:

1. Selective clearing for all alternatives-latest MCACES numbers are fine-please use them for latest estimate
2. Change stockpile mulch for spreading to Contractor 'air-curtain' burn with permit required for all exotic vegetation eradication
- 2a. Add 'bring in mulch from offsite' for all THH plantings (see below)
3. Add excavation for Alternative 2A only-Pond Creation (2.1 acres)(otherwise light earthwork for interpretive trail)
4. Plantings for all alternatives-quantities have changed due to recent site visit & meetings-to be installed between May & September (rainy season)
5. Add Temporary fencing to protect planting in designated area (dune/coastal strand near 'solar-gate' only) (2,500 LF) i.e.: 'snow drift fencing'
6. Trash (debris/rubble) removal needs to be added to all alternatives-300 CY(Alt 2 & 2A), 150 CY(Alt 3), 30 CY(Alt 4)
7. Change mulch quantities for all Tropical Hardwood Hammock Plantings (only) for all alternatives
8. Watering one-day (or 'reasonable' per S.Burch) a week for tropical hardwood hammock and dune/coastal strand plantings only (water source on-site)
9. Recreation: Add 9,300 LF of 8-foot wide, 3-inch deep, crushed shell trail; one-half would be constructed over existing maintenance trails
10. Recreation: Add 8, 6-foot tall, interpretive wood signs with illustrations and verbiage
11. Recreation: Add 8, 6-foot long recycled plastic benches with backs, no arms, posts anchored with minimum concrete
12. Per discussion with P. Stevenson this date, delete plant replacement costs. 85% survivability rate is to encourage good practices by Contractor; a prudent Contractor will include cost of achieving 85% survivability (good plant stock, appropriate planting techniques, watering, replacement) in the material cost of the plants.

3/18/04: TTL; adjusted plant costs to reflect species listed in Table 2-Restoration Plant Species and Installation Information, provided by P. Stevenson, PD-PN, and average costs (wholesale) for those species as listed in Betrock's Plant Finder, December 15, 2003.

3/22/04: TTL; changed escalation cost to zero and effective pricing date to 10/1/04, per ER 1110-2-1302, page C-2, fully funded estimate (with escalation) to be developed at time MSC issues public notice.

3/22/04: TTL; to include incineration of vegetative debris, changed 'stockpile mulch for spreading' to 'burn vegetative debris' and added an item for burning.

3/23/04: TTL; changed acreages to match write up provided by P. Stevenson, PD-PN, dated 3-11-04.

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

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Fri 09 Sep 2005  
Eff. Date 10/01/05  
PROJECT NOTES

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135

TIME 09:22:39  
TITLE PAGE 4

---

3/24/04: TTL; changed structure of estimate to reflect WBS. Revised PED cost to \$150,000, reasonable minimum, and S&A to 10%, due to likelihood of 8a contract for construction.

3/26/04: TTL; adjusted planting productivity factors using Means Building Construction Cost Data 2003 as a reference. Means 02912, vinca, bare root, 150 per hour; 02930, rosemary, 75 per hour; and 02930, azalea, 12 per hour.

LABOR ID: NAT00A EQUIP ID: REG03Z

Currency in DOLLARS

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PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
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TIME 09:22:39  
SUMMARY PAGE 1

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
1 Construction Costs									
1-06 Fish & Wildlife Facilities	1.00	EA	1,363,900	27,400	347,800	1,739,200	1739153		
1-14 Recreation Facilities	1.00	EA	99,200	2,000	25,300	126,500	126494.94		
TOTAL Construction Costs	1.00	EA	1,463,100	29,400	373,100	1,865,600	1865648		
2 Non-Construction Costs									
2-01 Lands & Damages	1.00	EA	27,500	0	0	27,500	27500.00		
2-30 Planning, Engineering and Design	1.00	EA	156,000	0	0	156,000	156000.00		
2-31 Construction Management	1.00	EA	144,400	0	0	144,400	144400.00		
TOTAL Non-Construction Costs	1.00	EA	327,900	0	0	327,900	327900.00		
TOTAL Virginia Key 1135 ERR			1,791,000	29,400	373,100	2,193,500			

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

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PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 2

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	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST UNIT COST
-----							
1 Construction Costs							
1-06 Fish & Wildlife Facilities							
1-06/01 Fish and Wildlife Alt. 2							
1-06/01. 1 Wetlands Restoration Area							
1-06/01. 1. 1 Selective Clearing	3.90	ACR	22,300	400	5,700	28,400	7282.23
TOTAL Selective Clearing	3.90	ACR	22,300	400	5,700	28,400	7282.23
1-06/01. 1. 3 W.R. - WR							
1-06/01. 1. 3/ 1 Plant herbaceous plants	200	EA	400	0	100	500	2.72
1-06/01. 1. 3/ 2 Plant shrubs	150	EA	900	0	200	1,100	7.47
1-06/01. 1. 3/ 3 Plant trees	110	EA	600	0	200	800	7.47
TOTAL W.R. - WR	3.20	ACR	1,900	0	500	2,500	776.62
1-06/01. 1. 4 W.R. - WSR							
1-06/01. 1. 4/ 1 Plant trees	30.00	EA	200	0	0	200	7.30
1-06/01. 1. 4/ 2 Plant herbaceous plants	110	EA	200	0	0	200	2.25
1-06/01. 1. 4/ 3 Plant shrubs	65.00	EA	400	0	100	500	7.30
TOTAL W.R. - WSR	0.70	ACR	700	0	200	900	1343.08
1-06/01. 1. 9 Burn vegetative debris	3.90	ACR	13,300	300	3,400	16,900	4332.56
TOTAL Wetlands Restoration Area	3.90	ACR	38,200	800	9,700	48,700	12493.09
1-06/01. 2 Tropical Hardwood Hammock							
1-06/01. 2. 1 Selective Clearing	24.20	ACR	138,200	2,800	35,200	176,200	7282.23
TOTAL Selective Clearing	24.20	ACR	138,200	2,800	35,200	176,200	7282.23
1-06/01. 2. 2 THH-1							
1-06/01. 2. 2/ 1 Plant THH shrubs	480	EA	4,200	100	1,100	5,400	11.18
1-06/01. 2. 2/ 2 Plant THH Trees	255	EA	7,200	100	1,800	9,200	36.03
TOTAL THH-1	1.30	ACR	11,400	200	2,900	14,600	11197.04

LABOR ID: NAT00A

EQUIP ID: REG032

Currency in DOLLARS

CREW ID: NAT00A

UPS ID: UP01EA



Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 3

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
1-06/01. 2. 3 THH-2									
1-06/01. 2. 3/ 1 Plant THH Shrubs	815	EA	7,100	100	1,800	9,100		11.18	
1-06/01. 2. 3/ 2 Plant THH Trees	430	EA	12,200	200	3,100	15,500		36.03	
TOTAL THH-2	2.20	ACR	19,300	400	4,900	24,600		11185.52	
1-06/01. 2. 4 THH-3									
1-06/01. 2. 4/ 1 Plant THH Shrubs	775	EA	6,800	100	1,700	8,700		11.18	
1-06/01. 2. 4/ 2 Plant THH Trees	410	EA	11,600	200	3,000	14,800		36.03	
TOTAL THH-3	2.10	ACR	18,400	400	4,700	23,400		11161.99	
1-06/01. 2. 5 THH-4									
1-06/01. 2. 5/ 1 Plant THH Shrubs	6520	EA	57,200	1,100	14,600	72,900		11.18	
1-06/01. 2. 5/ 2 Plant THH Trees	3435	EA	97,100	2,000	24,800	123,800		36.03	
TOTAL THH-4	17.60	ACR	154,200	3,100	39,300	196,700		11175.29	
1-06/01. 2. 6 Watering	24.20	ACR	112,000	2,300	28,600	142,800		5901.87	
1-06/01. 2. 9 Burn vegetative debris	24.20	ACR	82,200	1,700	21,000	104,800		4332.56	
1-06/01. 2.11 Furnish & Spread Mulch	2873	CY	131,900	2,700	33,600	168,200		58.56	
1-06/01. 2.12 THH-5									
1-06/01. 2.12/ 1 Plant THH Shrubs	370	EA	3,200	100	800	4,100		11.18	
1-06/01. 2.12/ 2 Plant THH Trees	195	EA	5,500	100	1,400	7,000		36.03	
TOTAL THH-5	1.00	ACR	8,800	200	2,200	11,200		11164.06	
TOTAL Tropical Hardwood Hammock	24.20	ACR	676,500	13,600	172,500	862,600		35644.80	
1-06/01. 3 Dune / Coastal Strand									
1-06/01. 3. 1 Selective Clearing	8.20	ACR	46,800	900	11,900	59,700		7282.23	
TOTAL Selective Clearing	8.20	ACR	46,800	900	11,900	59,700		7282.23	
1-06/01. 3. 2 DCS-1									
1-06/01. 3. 2/ 1 Plant DCS herbaceous plants	3500	EA	15,800	300	4,000	20,100		5.74	
1-06/01. 3. 2/ 2 Plant DCS Trees	80.00	EA	2,300	0	600	2,900		36.14	
TOTAL DCS-1	2.90	ACR	18,000	400	4,600	23,000		7927.48	

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

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PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 4

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
1-06/01. 3. 3 DCS-2									
1-06/01. 3. 3/ 1 Plant DCS herbaceous plants	3020	EA	13,600	300	3,500	17,300			5.74
1-06/01. 3. 3/ 2 Plant DCS trees	70.00	EA	2,000	0	500	2,500			36.14
TOTAL DCS-2	2.50	ACR	15,600	300	4,000	19,900			7948.77
1-06/01. 3. 4 DCS-3									
1-06/01. 3. 4/ 1 Plant DCS herbaceous plants	2395	EA	10,800	200	2,800	13,800			5.74
1-06/01. 3. 4/ 2 Plant DCS trees	55.00	EA	1,600	0	400	2,000			36.14
TOTAL DCS-3	2.00	ACR	12,300	200	3,100	15,700			7870.40
1-06/01. 3. 5 DCS-4									
1-06/01. 3. 5/ 1 Plant DCS herbaceous plants	960	EA	4,300	100	1,100	5,500			5.74
1-06/01. 3. 5/ 2 Plant DCS trees	25.00	EA	700	0	200	900			36.14
TOTAL DCS-4	0.80	ACR	5,000	100	1,300	6,400			8020.29
1-06/01. 3. 6 Watering	8.20	ACR	38,000	800	9,700	48,400			5901.87
1-06/01. 3. 8 Fencing									
1-06/01. 3. 8/ 1 Fencing	2500	LF	11,700	200	3,000	14,900			5.95
TOTAL Fencing	1.00	EA	11,700	200	3,000	14,900			14885.38
1-06/01. 3. 9 Burn vegetative debris	8.20	ACR	18,100	400	4,600	23,100			2816.33
TOTAL Dune / Coastal Strand	8.20	ACR	165,600	3,300	42,200	211,100			25744.83
1-06/01. 4 Debris/rubble removal									
1-06/01. 4. 1 Debris/rubble removal	300	CY	5,400	100	1,400	6,900			22.93
TOTAL Debris/rubble removal			5,400	100	1,400	6,900			
TOTAL Fish and Wildlife Alt. 2			885,700	17,800	225,900	1,129,300			
1-06/02 Fish and Wildlife Alt. 3									
1-06/02. 1 Wetlands Restoration Area									
1-06/02. 1. 1 Selective Clearing	6.60	ACR	37,700	800	9,600	48,100			7282.23

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 5

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
TOTAL Selective Clearing	6.60	ACR	37,700	800	9,600	48,100	7282.23		
1-06/02. 1. 3 W.R. - WSR #1									
1-06/02. 1. 3/ 1 Plant herbaceous wetland strand	1000	EA	1,800	0	400	2,200	2.25		
1-06/02. 1. 3/ 2 Plant wetland strand shrubs	500	EA	2,900	100	700	3,600	7.30		
1-06/02. 1. 3/ 3 Plant wetland strand trees	240	EA	1,400	0	400	1,800	7.30		
TOTAL W.R. - WSR #1	4.30	ACR	6,000	100	1,500	7,600	1777.86		
1-06/02. 1. 4 W.R. - WSR #2									
1-06/02. 1. 4/ 1 Plant wetland strand herbaceous	1200	EA	2,100	0	500	2,700	2.25		
1-06/02. 1. 4/ 2 Plant wetland strand shrubs	750	EA	4,300	100	1,100	5,500	7.30		
1-06/02. 1. 4/ 3 Plant wetland strand trees	315	EA	1,800	0	500	2,300	7.30		
TOTAL W.R. - WSR #2	2.30	ACR	8,200	200	2,100	10,500	4550.10		
1-06/02. 1. 9 Burn vegetative debris	6.60	ACR	22,400	500	5,700	28,600	4332.56		
TOTAL Wetlands Restoration Area	6.60	ACR	74,300	1,500	19,000	94,800	14358.74		
1-06/02. 2 Tropical Hardwood Hammock									
1-06/02. 2. 1 Selective Clearing	9.20	ACR	52,500	1,100	13,400	67,000	7282.23		
TOTAL Selective Clearing	9.20	ACR	52,500	1,100	13,400	67,000	7282.23		
1-06/02. 2. 2 THH-1									
1-06/02. 2. 2/ 1 Plant THH Shrubs	630	EA	5,500	100	1,400	7,000	11.18		
1-06/02. 2. 2/ 2 Plant THH Trees	335	EA	9,500	200	2,400	12,100	36.03		
TOTAL THH-1	1.70	ACR	15,000	300	3,800	19,100	11244.83		
1-06/02. 2. 3 THH-2									
1-06/02. 2. 3/ 1 Plant THH shrubs	2775	EA	24,300	500	6,200	31,000	11.18		
1-06/02. 2. 3/ 2 Plant THH trees	1465	EA	41,400	800	10,600	52,800	36.03		
TOTAL THH-2	7.50	ACR	65,700	1,300	16,800	83,800	11176.07		
1-06/02. 2. 6 Watering	9.20	ACR	42,600	900	10,900	54,300	5901.87		
1-06/02. 2. 9 Burn vegetative debris	9.20	ACR	31,300	600	8,000	39,900	4332.56		
1-06/02. 2.11 Furnish & Spread Mulch	1091	CY	50,100	1,000	12,800	63,900	58.56		

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

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UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 6

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
TOTAL Tropical Hardwood Hammock	9.20	ACR	257,200	5,200	65,600	328,000		35650.08	
1-06/02. 3 Dune / Coastal Strand									
1-06/02. 3. 1 Selective Clearing	3.40	ACR	19,400	400	5,000	24,800		7282.24	
TOTAL Selective Clearing	3.40	ACR	19,400	400	5,000	24,800		7282.24	
1-06/02. 3. 2 DCS-1									
1-06/02. 3. 2/ 1 Plant DCS herbaceous plants	3350	EA	15,100	300	3,800	19,200		5.74	
1-06/02. 3. 2/ 2 Plant DCS trees	75.00	EA	2,100	0	500	2,700		36.14	
TOTAL DCS-1	2.80	ACR	17,200	300	4,400	21,900		7838.43	
1-06/02. 3. 3 DCS-2									
1-06/02. 3. 3/ 1 Plant DCS herbaceous plants	720	EA	3,200	100	800	4,100		5.74	
1-06/02. 3. 3/ 2 Plant DCS trees	15.00	EA	400	0	100	500		36.14	
TOTAL DCS-2	0.60	ACR	3,700	100	900	4,700		7794.40	
1-06/02. 3. 6 Watering	3.40	ACR	15,700	300	4,000	20,100		5901.87	
1-06/02. 3. 9 Burn vegetative debris	3.40	ACR	11,600	200	2,900	14,700		4332.56	
TOTAL Dune / Coastal Strand	3.40	ACR	67,600	1,400	17,200	86,200		25347.33	
1-06/02. 4 Debris/rubble removal									
1-06/02. 4. 1 Debris/rubble removal	150	CY	2,700	100	700	3,400		22.93	
TOTAL Debris/rubble removal			2,700	100	700	3,400			
TOTAL Fish and Wildlife Alt. 3			401,800	8,100	102,500	512,400			
1-06/03 Fish and Wildlife Alt. 4									
1-06/03. 1 Tropical Hardwood Hammock									
1-06/03. 1. 1 Selective Clearing	1.50	ACR	8,600	200	2,200	10,900		7282.23	
TOTAL Selective Clearing	1.50	ACR	8,600	200	2,200	10,900		7282.23	
1-06/03. 1. 2 THH-1									

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 7

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL CST	UNIT COST
1-06/03. 1. 2/ 1 Plant THH Shrubs	555	EA	4,900	100	1,200	6,200	11.18
1-06/03. 1. 2/ 2 Plant THH trees	115	EA	3,200	100	800	4,100	36.03
TOTAL THH-1	1.50	ACR	8,100	200	2,100	10,300	6899.96
1-06/03. 1. 6 Watering	1.50	ACR	6,900	100	1,800	8,900	5901.87
1-06/03. 1. 9 Burn vegetative debris	1.50	ACR	5,100	100	1,300	6,500	4332.56
1-06/03. 1.11 Furnish & Spread Mulch	113	CY	5,200	100	1,300	6,600	58.56
TOTAL Tropical Hardwood Hammock	1.50	ACR	33,900	700	8,600	43,200	28828.26
1-06/03. 2 Dune / Coastal Strand							
1-06/03. 2. 1 Selective Clearing	2.10	ACR	12,000	200	3,100	15,300	7282.23
TOTAL Selective Clearing	2.10	ACR	12,000	200	3,100	15,300	7282.23
1-06/03. 2. 2 DCS-1							
1-06/03. 2. 2/ 1 Plant DCS herbaceous plants	2540	EA	11,400	200	2,900	14,600	5.74
1-06/03. 2. 2/ 2 Plant DCS trees	60.00	EA	1,700	0	400	2,200	36.14
TOTAL DCS-1	2.10	ACR	13,100	300	3,400	16,800	7978.17
1-06/03. 2. 6 Watering	2.10	ACR	9,700	200	2,500	12,400	5901.87
1-06/03. 2. 9 Burn vegetative debris	2.10	ACR	7,100	100	1,800	9,100	4332.56
TOTAL Dune / Coastal Strand	2.10	ACR	42,000	800	10,700	53,500	25494.83
1-06/03. 3 Debris/rubble removal							
1-06/03. 3. 1 Debris/rubble removal	30.00	CY	500	0	100	700	22.93
TOTAL Debris/rubble removal			500	0	100	700	
TOTAL Fish and Wildlife Alt. 4			76,400	1,500	19,500	97,500	
TOTAL Fish & Wildlife Facilities	1.00	EA	1,363,900	27,400	347,800	1,739,200	1739153
1-14 Recreation Facilities							
1-14/01 Recreation Facilities							
1-14/01. 5 Recreation Features							
1-14/01. 5. 1 Trail			54,700	1,100	14,000	69,800	
1-14/01. 5. 2 Signs			34,000	700	8,700	43,300	

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

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UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:22:39  
SUMMARY PAGE 8

		QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
1-14/01. 5. 3 Benches				10,500	200	2,700	13,400			
TOTAL Recreation Features				99,200	2,000	25,300	126,500			
TOTAL Recreation Facilities				99,200	2,000	25,300	126,500			
TOTAL Recreation Facilities		1.00	EA	99,200	2,000	25,300	126,500	126494.94		
TOTAL Construction Costs		1.00	EA	1,463,100	29,400	373,100	1,865,600	1865648		
2 Non-Construction Costs										
2-01 Lands & Damages										
2-01/23 Construction Contract Documents										
2-01/23.01 Administration Costs		1.00	EA	27,500	0	0	27,500	27500.00		
TOTAL Construction Contract Documents		1.00	EA	27,500	0	0	27,500	27500.00		
TOTAL Lands & Damages		1.00	EA	27,500	0	0	27,500	27500.00		
2-30 Planning, Engineering and Design										
2-30/23 Construction Contract Documents		1.00	EA	156,000	0	0	156,000	156000.00		
TOTAL Planning, Engineering and Design		1.00	EA	156,000	0	0	156,000	156000.00		
2-31 Construction Management										
2-31/23 Construction Contract		1.00	EA	144,400	0	0	144,400	144400.00		
TOTAL Construction Management		1.00	EA	144,400	0	0	144,400	144400.00		
TOTAL Non-Construction Costs		1.00	EA	327,900	0	0	327,900	327900.00		
TOTAL Virginia Key 1135 ERR				1,791,000	29,400	373,100	2,193,500			

LABOR ID: NAT00A EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
ERROR REPORT

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135

TIME 09:22:39  
ERROR PAGE 1

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No errors detected...

\* \* \* END OF ERROR REPORT \* \* \*

LABOR ID: NAT00A EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A UPB ID: UP01EA



Fri 09 Sep 2005  
Eff. Date 10/01/05  
TABLE OF CONTENTS

U.S. Army Corps of Engineers  
PROJECT MIV501: Virginia Key 1135 ERR - Recommended Plan  
Virginia Key 1135

TIME 09:22:39  
CONTENTS PAGE 1

---

SUMMARY REPORTS	SUMMARY PAGE
PROJECT OWNER SUMMARY - Level 2.....	1
PROJECT OWNER SUMMARY - Level 6.....	2

No Detailed Estimate...

No Backup Reports...

\* \* \* END TABLE OF CONTENTS \* \* \*

Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV502: Virginia Key 1135 ERR - Alternatives 2, 2A, 3 and 4  
Virginia Key 1135

TIME 09:19:16  
TITLE PAGE 1

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Virginia Key 1135 ERR  
Alternatives 2, 2A, 3 and 4  
Operations and Maintenance  
Costs

Designed By: CESAJ  
Estimated By: Tracy Leaser

Prepared By: Tracy Leaser

Preparation Date: 09/09/05  
Effective Date of Pricing: 10/01/05

Sales Tax: 7.30%

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LABOR ID: NAT00A EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
PROJECT NOTES

U.S. Army Corps of Engineers  
PROJECT MIV502: Virginia Key 1135 ERR - Alternatives 2, 2A, 3 and 4  
Virginia Key 1135

TIME 09:19:16  
TITLE PAGE 2

\*9/9/05: This estimate is for O&M costs only. The same notes apply to this estimate as to the estimate for the Recommended Plan. Note the timing of the individual events is as follows:

Crushed shell trail, replace every 5-7 years  
Signs, replace every 5 years  
Park benches, replace every 10-15 years  
Litter pick-up, monthly  
Exotic vegetation removal, monthly for the first year, bi-monthly for the second year and quarterly for the third year.

Basis for estimates are as follows:

Appendix B of report sent 10/20/03 from PD.

Email from PD-PN 10/24/03 regarding disposition of exotics. Exotics will be chipped and composted on site to supplement mulch requirement. Assume mulch from exotics provides 15% of required mulch.

Email from PD-PN 10/20/03 regarding mulch requirements. Mulch is required for tropical hardwood hammock as 0.5 cy per tree and 0.25 cy per shrub. No mulch required for dune/coastal strand or wetlands plantings.

Costs escalated to assumed midpoint of construction as Oct 2005.  
Contingency: 25%  
No input for PED costs so a 10% flat rate was assumed.  
S&A: 8%

Construction schedules:

Each alternative should include 1 growing season to allow plant materials to reach adequate size for installation.  
For clearing and installation, allow 1 year for Alts. 2, 2A & 3 and 9 months for Alt. 4.

3/16/04, TTL: Updated Equipment Database area factors to match those recently published in EP 1110-1-8, Vol. 3, 31 July 03. Updated the gasoline cost per gallon to \$1.74, state average as reported in the Florida Times-Union on 3/10/04. Updated diesel cost per gallon (off-road use) to \$1.40, per e-mail message from B. Blake reporting quote for diesel.

3/16/04, TTL: In keeping with notes taken by S. Burch in meeting last week and meeting held this date with P. Stevenson, PD-PN, made the following changes:

1. Selective clearing for all alternatives-latest MCACES numbers are fine-please use them for latest estimate
2. Change stockpile mulch for spreading to Contractor 'air-curtain' burn with permit required for all exotic vegetation eradication
- 2a. Add 'bring in mulch from offsite' for all THH plantings (see below)
3. Add excavation for Alternative 2A only-Pond Creation (2.1 acres)(otherwise light earthwork for interpretive trail)
4. Plantings for all alternatives-quantities have changed due to recent site

LABOR ID: NAT00A

EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
PROJECT NOTES

U.S. Army Corps of Engineers  
PROJECT MIV502: Virginia Key 1135 ERR - Alternatives 2, 2A, 3 and 4  
Virginia Key 1135

TIME 09:19:16  
TITLE PAGE 3

visit & meetings-to be installed between May & September (rainy season)  
5. Add Temporary fencing to protect planting in designated area  
(dune/coastal strand near 'solar-gate' only) (2,500 LF) i.e.: 'snow drift  
fencing'  
6. Trash (debris/rubble) removal needs to be added to all alternatives-300  
CY(Alt 2 & 2A), 150 CY(Alt 3), 30 CY(Alt 4)  
7. Change mulch quantities for all Tropical Hardwood Hammock Plantings  
(only) for all alternatives  
8. Watering one-day (or 'reasonable' per S.Burch) a week for tropical  
hardwood hammock and dune/coastal strand plantings only (water source  
on-site)  
9. Recreation: Add 9,300 LF of 8-foot wide, 3-inch deep, crushed shell  
trail; one-half would be constructed over existing maintenance trails  
10. Recreation: Add 8, 6-foot tall, interpretive wood signs with  
illustrations and verbiage  
11. Recreation: Add 8, 6-foot long recycled plastic benches with backs, no  
arms, posts anchored with minimum concrete  
12. Per discussion with P. Stevenson this date, delete plant replacement  
costs. 85% survivability rate is to encourage good practices by Contractor;  
a prudent Contractor will include cost of achieving 85% survivability (good  
plant stock, appropriate planting techniques, watering, replacement) in the  
material cost of the plants.  
  
3/18/04: TTL; adjusted plant costs to reflect species listed in Table  
2-Restoration Plant Species and Installation Information, provided by P.  
Stevenson, PD-PN, and average costs (wholesale) for those species as listed  
in Betrock's Plant Finder, December 15, 2003.  
  
3/22/04: TTL; changed escalation cost to zero and effective pricing date to  
10/1/04, per ER 1110-2-1302, page C-2, fully funded estimate (with  
escalation) to be developed at time MSC issues public notice.  
  
3/22/04: TTL; to include incineration of vegetative debris, changed  
'stockpile mulch for spreading' to 'burn vegetative debris' and added an item  
for burning.  
  
3/23/04: TTL; changed acreages to match write up provided by P. Stevenson,  
PD-PN, dated 3-11-04.  
  
3/24/04: TTL; changed structure of estimate to reflect WBS. Revised PED  
cost to \$150,000, reasonable minimum, and S&A to 10%, due to likelihood of 8a  
contract for construction.  
  
3/26/04: TTL; adjusted planting productivity factors using Means Building  
Construction Cost Data 2003 as a reference. Means 02912, vinca, bare root,  
150 per hour; 02930, rosemary, 75 per hour; and 02930, azalea, 12 per hour.

LABOR ID: NAT00A

EQUIP ID: REG03Z

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CREW ID: NAT00A

UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05

U.S. Army Corps of Engineers  
PROJECT MIV502: Virginia Key 1135 ERR - Alternatives 2, 2A, 3 and 4  
Virginia Key 1135  
\*\* PROJECT OWNER SUMMARY - Level 6 (Rounded to 100's) \*\*

TIME 09:19:16  
SUMMARY PAGE 1

	QUANT	UOM	CONTRACT	ESCALAT	CONTING	TOTAL	CST	UNIT	COST
E Operations and Maintenance Costs									
E-01 Construction Costs									
E-01/06 Fish and Wildlife Facilities									
E-01/06.01 Litter Control									
E-01/06.01.01 Litter Control									
E-01/06.01.01/05	Litter Control/59.1	59.10	AC	3,700	100	900	4,700	80.16	
TOTAL Litter Control				3,700	100	900	4,700		
TOTAL Litter Control				3,700	100	900	4,700		
E-01/06.03 Remove exotic vegetation									
E-01/06.03.01 Selective clearing									
E-01/06.03.01/ 5	Selective Clearing/59.1 ac	59.10	ACR	5,600	100	1,400	7,100	120.56	
TOTAL Selective clearing				5,600	100	1,400	7,100		
TOTAL Remove exotic vegetation				5,600	100	1,400	7,100		
TOTAL Fish and Wildlife Facilities				9,300	200	2,400	11,900		
E-01/14 Recreation Facilities									
E-01/14.01	Trail			54,700	1,100	14,000	69,800		
E-01/14.02	Signs	8.00	EA	34,000	700	8,700	43,300	5413.10	
E-01/14.03	Benches	8.00	EA	10,500	200	2,700	13,400	1674.46	
TOTAL Recreation Facilities				99,200	2,000	25,300	126,500		
TOTAL Construction Costs				108,500	2,200	27,700	138,400		
E-02 Non-Construction Costs									
TOTAL Operations and Maintenance Costs				108,500	2,200	27,700	138,400		
TOTAL Virginia Key 1135 ERR				108,500	2,200	27,700	138,400		

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EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
ERROR REPORT

PROJECT MIV502: U.S. Army Corps of Engineers  
Virginia Key 1135 ERR - Alternatives 2, 2A, 3 and 4  
Virginia Key 1135

TIME 09:19:16  
ERROR PAGE 1

-----  
No errors detected...

\* \* \* END OF ERROR REPORT \* \* \*

LABOR ID: NAT00A EQUIP ID: REG03Z

Currency in DOLLARS

CREW ID: NAT00A UPB ID: UP01EA

Fri 09 Sep 2005  
Eff. Date 10/01/05  
TABLE OF CONTENTS

U.S. Army Corps of Engineers  
PROJECT MIV502: Virginia Key 1135 ERR - Alternatives 2, 2A, 3 and 4  
Virginia Key 1135

TIME 09:19:16  
CONTENTS PAGE 1

---

SUMMARY REPORTS

SUMMARY PAGE

PROJECT OWNER SUMMARY - Level 6.....1

No Detailed Estimate...

No Backup Reports...

\* \* \* END TABLE OF CONTENTS \* \* \*



Virginia Key, .35 Study  
Recommended Plan Costs  
Operation Maintenance

TABLE A-1						
Operation and Maintenance Costs						
Virginia Key Section 1135 Feasibility Study						
Recommended Plan						
Component	Quantity	Unit of Measure	Frequency	Notes	Cost Per Given Quantity	
Crushed shell trail	9,300	Feet	Every 5-7 years	Same cost as construction		\$69,800
Signs	8	Each	Every 5 years	Same cost as construction		\$43,300
Park benches	8	Each	Every 10-15 years	Same cost as construction		\$13,400
Litter pick-up	59.1	Acre	Monthly	Based on three-person crew, 2 ac/hr		\$4,700
Exotic vegetation removal	59.1	Acre	Monthly, first year Bi-monthly, second year Quarterly, third year	Same crew as construction, productivity = 3 ac/hr		\$7,100

**SECTION 1135**

**ECOSYSTEM RESTORATION REPORT  
AND  
ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY  
MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX B**

**Restoration Vegetation Recommendations**

**U.S. Army Engineer District  
Jacksonville, Florida**

## **APPENDIX B**

### **RESTORATION VEGETATION RECOMMENDATIONS**

#### **Virginia Key, Miami-Dade County, Florida**

##### **Section 1135 Study**

#### **BACKGROUND**

The following write-up is based on industry standards, local professional expertise combined with best professional judgment to restore the barrier island lands on Virginia Key, under Section 1135 of the Water Resources Development Act of 1986. The proposed project is located north of Rickenbacker Causeway, fronted by the Atlantic Ocean and currently owned by the City of Miami. It was historically established as a "colored" beach in June 1945 (Virginia Key Beach Park Trust, 2003). The lands have been closed since 1982 and exotic invasive plant species have flourished and degraded the environmental quality of the proposed project area. The following information is based on several meetings and site visits with local Miami-Dade County Department of Environmental Resources Management (DERM) restoration experts, the latest occurring on January 22 and 23, 2004.

The proposed project would include restoration of existing tropical hardwood hammock, dune/coastal strand, wetland, and pond with wetland habitats. For the purposes of this project "pond with fringing wetlands", or "pond with wetlands" refers to freshwater areas near the center of the island. "Wetlands" refers to brackish wetland strand habitat near the shoreline that is affected by the tide. Exotic vegetation would be selectively cleared and air-curtain burned on-site with the intent of preserving native vegetation and planting around it to supplement it and restore a functioning habitat. Mulch would be utilized for the tropical hardwood hammock plantings. A watering contract would be instituted for the tropical hardwood hammock and dune/coastal strand habitats. It is recommended the vegetation installation occur between May and September, which is the heart of the rainy season in Miami-Dade County, Florida. Project area soils appear to be suitable for restoration plantings without amendments or additional preparation. The health of native, mature plant species to be preserved appears to be good.

Table B-1 is the Restoration Management Strategy, which displays restoration strategies as discussed with local restoration experts in the field. Refer to Tables B-3 through B-6 to view alternative habitat restoration acreage breakdowns per alternative. Table B-2 is the proposed restoration plant list per habitat. The planting restoration information is based on site inspections that analyzed soil types, salt spray influences, mean high water lines, existing vegetation types, rough percentages of vegetation to be preserved and exotics to be removed, wildlife habitat value, construction methodologies and management techniques to ensure mature habitat restoration. Possible site gradework would be minimal with the exception of the 2.1-acre pond creation.

#### **SELECTIVE CLEARING/DISPOSAL**

Selective clearing would be done over the entire proposed project site to selectively remove undesirable exotic vegetation only. This would be accomplished with minimal heavy equipment use

and mainly with hand clearing via chain saws, handsaws, loppers and machetes. Heavy tree removal may require some heavier equipment but only where access would not damage vegetation to be preserved. Selective clearing would be accomplished in the most environmentally friendly manner possible. Minimal disturbance to native vegetation and soils to remain on site is the goal. After habitat restoration segments have been cleared, restoration plantings would be undertaken. The contractor would be responsible for a burn permit to 'air-curtain burn' the cleared exotics for disposal on-site. This method would be the most environmentally friendly and cost-effective manner of exotic vegetation removal.

## **PLANTING MATERIALS**

The restoration plant species, sizes, spacing and associated materials have been selected to provide the best habitat restoration. These items would provide the most cost-effective habitat value using industry standards as a basis. The vegetative materials selected will provide overstory, understory and groundcover components essential for the development of a holistic, productive, and functioning habitat. Plant selection and installation spacing would be based on existing conditions, habitat type to be restored, soils, geographic location, sun tolerances, salt tolerance, wildlife value, mulch and water requirements. Plant materials would be mixed into the area for a diverse planting result with a staggered pattern to develop a diverse natural habitat. On-site seed sources were determined to be inadequate to complete the restoration envisioned. Solid wastes (trash) would be removed before plant installations.

Overstory plantings (trees and or large shrubs) would be grown in and installed from 3-gallon containers with native soils (see Table B-1, 2<sup>nd</sup> column from right). Where habitat conditions provide more rapid plant growth (wetland restoration, pond creation) smaller vegetation could be installed from 4" liners, grow cones and 1-gallon containers where available. Most 'trees' would be a minimum 24 inches tall with a spread up to 12 inches when installed. Understory plantings (shrubs, herbaceous and groundcover) would be grown in and installed from 4" liners and 1-gallon containers for cost effectiveness. Installation spacing would be based on habitat type (see Table B-1, far right column). Herbaceous plant materials for the Dune/Coastal Strand would be grown in and installed from 4" liners spaced 3-foot on center. Prototypical large shrubs in 3-gallon containers would also be installed, as noted in Table B-1. Aquatic herbaceous plant materials would be grown in and installed from 4" liners spaced 5-foot on center as noted in Table B-1. The best time to install the plant materials is between May and Sept, which is the rainy season in Miami-Dade County, Florida.

## **MULCH**

Mulch is the key to tropical hardwood hammock plant survival and would help to keep plants moist, reduce exotic vegetation growth and help to prevent soil erosion. The proposed tropical hardwood hammock plantings would be the only habitat restoration planting type to be mulched. It is recommended that "Floramulch" (or similar) be delivered and offloaded at the restoration site in 100 cubic yard trucks. This is the most cost-effective means (\$25/CY) to mulch the plantings. It is recommended that mulch be placed 6 inches deep around the plantings in 5-foot diameter circles for trees and 3-foot diameter circles for shrubs (see Table B-8 for estimated mulch quantities).

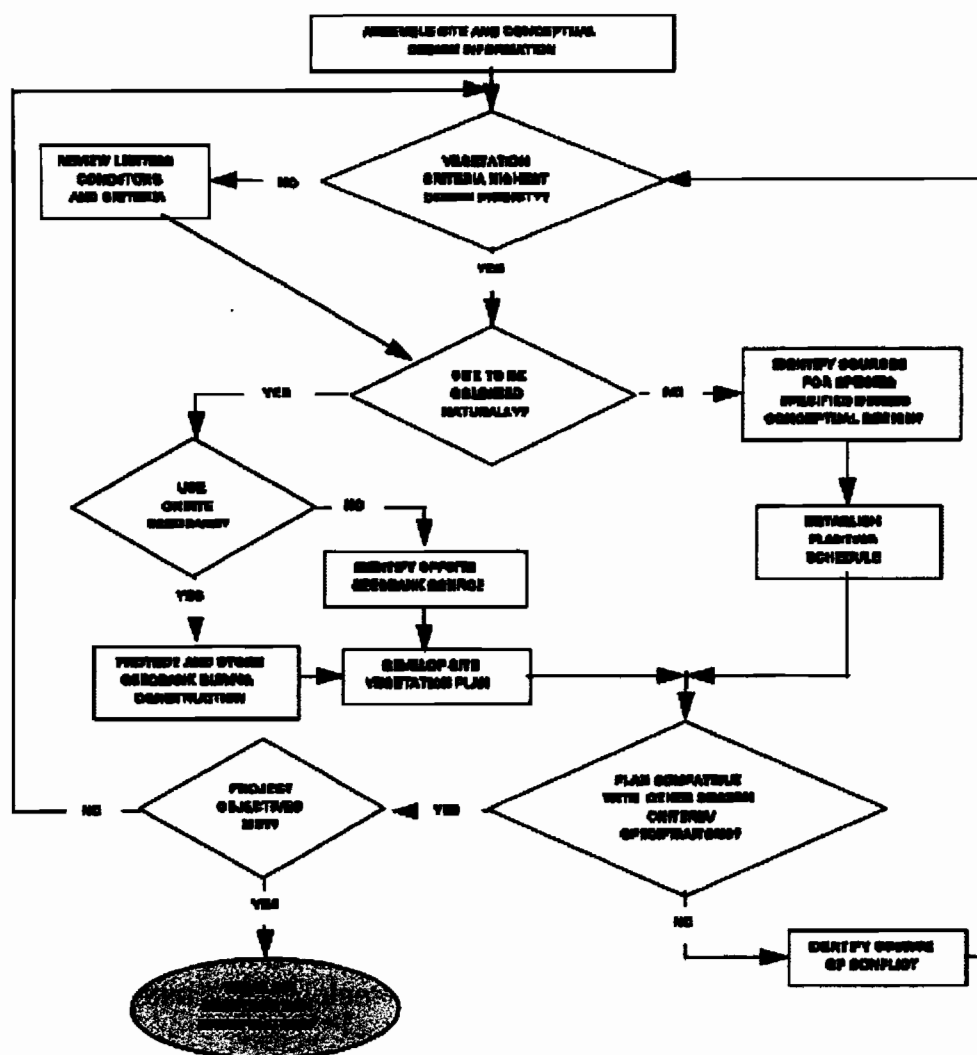


Figure B-1: Decision sequence for planning wetland vegetation restoration.

## RESTORATION PLANTING DECISIONS

Virginia Key Section 1135 Restoration planting considerations were based on the thought process outline in Figure B-1 above. Site visits and inspections with local experts provided the site-specific knowledge needed to develop Table B-1, Virginia Key Section 1135 Restoration Management Strategy. Table B-1 itemizes restoration alternatives into components. Components are further itemized into overstory and understory planting percentages based on exotic vegetation to be removed and native vegetation to remain, which determines the amount of area to be vegetated with native plantings. Trees, shrubs and herbaceous plantings are proposed based on overstory and understory percentages and habitat restoration requirements. Planting quantities, sizes and spacing are also provided. A list of acronyms for Table B-1 is available at the bottom of the page. The No Action Alternative is assumed to be Alternative 1. Table B-10, Tropical Hardwood One-Acre Planting Template, is provided as an example of the recommended plant mix per acre. Table B-2, Native Plant Species Suitable for Ecosystem Restoration, Virginia Key, Florida, further identifies which plant species are best suited for the specific habitat restoration requirements. Common and botanical

names are provided, as are the plant container sizes for cost estimating purposes. Plant installation spacing is also provided. Tables B-3 through B-6 summarize the restoration acreages per alternative under habitat type to be restored. Tables B-7 and B-9 display the process for developing restoration maintenance costs for a three-year period and an annual cost also. Table B-8 provides estimated mulch quantities for cost estimating purposes.

### **WATERING CONTRACT**

A 45-day watering contract would help to ensure plant establishment of the tropical hardwood hammock and dune/coastal strand habitat restoration plantings. An equally spaced, once per week, potable watering, to thoroughly soak the installed plants, without washing away mulch or soil from the plant base or damaging the planted material, is recommended. This watering recommendation would not replace or influence the contractor's 'best judgement' in providing for 85% vegetation survival, but is essentially for cost estimating purposes. The contractor would be responsible to replace any plant materials damaged by the watering at his own cost. Miami-Dade County may be able to provide a potable water source near the proposed restoration project area for cost-effectiveness. The contractor would guarantee a minimum of an 85% plant survival rate over the first six months, included in their cost, which is an industry standard.

### **RESTORATION MAINTENANCE**

It is anticipated that this task will be performed by the local sponsor. Most maintenance techniques chosen are labor intensive. Maintenance for this proposed project would be as cost-effective as possible. A small crew (3 people) would walk the restored habitats with herbicide spray packs and machetes to kill weeds and exotic vegetation on a monthly basis for the first year, bi-monthly the second year, and quarterly the third year. A similar maintenance regime would be implemented for the restored wetland and pond creation. After the third year the restoration project should be self-sustaining. Volunteers could also be trained to assist with maintenance (Greenscape, 2004 and Blowing Rock Preserve, 2004). Exotic plants would be removed and disposed of to ensure seed containment. An annual mulching of installed vegetation would be a local sponsor option based on plant health and growth rate. See Table B-7 for Estimated Restoration Maintenance Costs, which may vary for the proposed project.

### **ALTERNATIVE 2 (Figure B-2)**

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#### **Pond with Wetland Restoration Area (WR) 3.2 Acres**

The wetland restoration area is located just north of the historical Virginia Key recreation concession facilities and is a nautilus shaped feature. Approximately one acre of open water area would not be planted. The area would be cleared of exotics and planted with littoral and other wetland plants that are salt tolerant and provide good wildlife value as food or habitat (see Table B-2: Wetlands – Pond (Littoral Shelf) Creation and Pond with Wetlands sections). Larger exotic trees would be cut and stumps treated to prevent resprouting with an environmentally safe herbicide. Plantings proposed for the wetland restoration would focus on shoreline materials with some interior wetland vegetation also. The fringe plant materials would include one-gallon red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), gulf cord grass (*Spartinae spartinae*), green Buttonwood (*Conocarpus erectus*), leatherleaf fern (*Acrostichum danaeifolium*). Interior wetland plant materials would include juncus (*Juncus roemerianus*), coastal spikerush, (*Eleocharis cellulosa*) as available. These planting would provide structure for refuge, nesting and colonization opportunities, plant material for herbivores and organic matter for decomposers.

- WR (3.2 AC) Approx. 110 trees, 150 shrubs, 200 herbaceous

**Totals:**

- Trees: 110
- Shrubs: 150
- Herbaceous: 200

**Wetland Restoration (WSR) 0.7 Acres**

The Wetland Restoration area is located landward of the dune/coastal strand habitat. It varies in width but is a critical component of the project restoration. Trees, shrubs and herbaceous plants are proposed for installation in this habitat area. Plant selection from Table B-2 (Wetlands – Strand (influenced by tide) and Tropical Hardwood Hammock sections) would be used to restore this area. Plantings in this area would be spaced and installed as per Table B-1. These plantings would provide structure for refuge, nesting and colonization opportunities, plant material for herbivores and organic matter for decomposers.

- WSR 1 (0.7 AC) approx. 30 trees, 65 shrubs, 110 herbaceous

**Totals:**

- Trees: 30
- Shrubs: 65
- Herbaceous: 110

**Tropical Hardwood Hammock (THH) 24.2 Acres**

The tropical hardwood hammock restoration component is located inland of the coastal strand ecosystem throughout the proposed project area. The area would be cleared of exotics and planted with native, salt tolerant, high wildlife value materials from the Table B-2. Table B-7 – Tropical Hammock – One-Acre Planting Template, (Nature Conservancy, 2003) should be referenced to assist with plant species coverage and quantities.

- THH 1 (1.3 AC) approx. 255 trees, 480 shrubs
- THH 2 (2.2 AC) approx. 430 trees, 815 shrubs
- THH 3 (2.1 AC) approx. 410 trees, 775 shrubs
- THH 4 (17.6 AC) approx. 3,435 trees, 6,520 shrubs
- THH 5 (1.0 AC) approx. 195 trees, 370 shrubs

**Totals:**

- Trees: 4,725
- Shrubs: 8,960

**Dune/Coastal Stand (D/CS) 8.2 Acres**

The Dune/Coastal Strand ecosystem is located along the eastern side of the proposed project area adjacent to the Atlantic Ocean shoreline. Selective clearing will be critical in this area as old-growth saw palmetto and other very slow growing native coastal plant species are located in this area to be preserved. The Dune/Coastal Strand plantings will help to catch sand, hold the beach and provide wildlife food and habitat. The restoration plantings are listed in Table B-2. This habitat would be planted to provide for more 'open beachfront' to allow the native plant species to 'succeed' into natural areas in a more cost-effective manner. Approximately 2,500 linear feet of temporary fencing (snow-fence) would be needed to protect the dune-coastal plantings from trampling.



- D/CS 1 (2.9 AC) 'Dune' approx. 3,500 herbaceous, 80 shrubs
- D/CS 2 (2.5 AC) 'Dune' approx. 3,020 herbaceous, 70 shrubs
- D/CS 3 (2.0 AC) 'Dune' approx. 2,395 herbaceous, 55 shrubs
- D/CS 4 (0.8 AC) 'Dune' approx. 960 herbaceous, 25 shrubs

**Totals:**

- Herbaceous: 9,875
- Shrubs: 230
- 2,500 linear feet of temporary fencing (i.e.: 'snowdrift' fence)

**ALTERNATIVE 2A (Figure B-3)**

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**Pond with Wetland Restoration Area (WR) 3.2 Acres**

(See above write-up for Alternative 2)

WR (3.9 AC) Approx. 110 trees, 150 shrubs, 200 herbaceous

**Totals:**

- Trees: 110
- Shrubs: 150
- Herbaceous: 200

**Wetland Restoration (WSR) 0.7 Acres**

(See above write-up for Alternative 2)

WSR 1 (0.7 AC) approx. 30 trees, 65 shrubs, 110 herbaceous

**Totals:**

- Trees: 30
- Shrubs: 65
- Herbaceous: 110

**Pond Creation (WPC) 2.1 Acres**

Plantings proposed for the constructed 2.1-acre pond would be installed on a 10-foot wide littoral shelf, gently sloped to a maximum 2-foot depth from waters edge, deepening to center appropriately. The littoral shelf of the pond would include native plants that provide good wildlife value as food or habitat and thrive under surrounding conditions (see Table B-2; Wetlands – Pond Littoral Shelf Creation sections). An equal mix of littoral herbaceous plants would include: *Spartina* (*Spartina patens*), gulf cord grass (*Spartina spartinae*), juncus (*Juncus roemerianus*), coastal spikerush, (*Eleocharis cellulosa*), spatterdock (*Nuphar lutea*), , slender cordgrass (*Spartina baken*), , pickerelweed (*Pontederia cordata*). An equal mix of upland plant materials (see Table B-2 Wetlands – Restoration) would include: Buttonwood (*Conocarpus erectus*), myrsine (*Rapanea punctata*), loblolly bay (*Persea borbonia*), leatherleaf fern (*Acrostichum daneifolium*), wax myrtle (*Myrica cerifera*), Buttonbush (*Cephananthus occidentalis*), swamp bay (*Persea palustris*). These planting would provide structure for refuge, nesting and colonization opportunities, plant material for herbivores and organic matter for decomposers. Sediments would be stabilized and ecosystem dynamics established that are not found elsewhere on-site. It is felt that the groundwater from the pond creation would be suitable for the desired restoration objectives and subsequent plant material selections.

- WPC (2.1 AC) approx. 115 trees, 225 shrubs, 375 herbaceous

**Totals:**

- Trees: 115
- Shrubs: 225
- Herbaceous: 375

#### **Tropical Hardwood Hammock (THH) 22.1 Acres**

(See above write-up for Alternative 2)

- THH 1 (1.3 AC) approx. 255 trees, 480 shrubs
- THH 2 (2.2 AC) approx. 430 trees, 815 shrubs
- THH 3 (2.1 AC) approx. 410 trees, 775 shrubs
- THH 4 (15.5 AC) approx. 3,025 trees, 5,740 shrubs
- THH 5 (1.0 AC) approx. 195 trees, 370 shrubs

#### **Totals:**

- Trees: 4,315
- Shrubs: 8,180

#### **Dune/Coastal Strand (DCS) 8.2 Acres**

(See above write-up for Alternative 2)

- DCS 1 (2.9 AC) 'Dune' approx. 3,500 herbaceous, 80 shrubs
- DCS 2 (2.5 AC) 'Dune' approx. 3,020 herbaceous, 70 shrubs
- DCS 3 (2.0 AC) 'Dune' approx. 2,395 herbaceous, 55 shrubs
- DCS 4 (0.8 AC) 'Dune' approx. 960 herbaceous, 25 shrubs

#### **Totals:**

- Herbaceous: 9,875
- Shrubs: 230
- 2,500 linear feet of temporary fencing (i.e.: 'snowdrift' fence)

### **ALTERNATIVE 3 (Figure B-4)**

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#### **Wetland Restoration (WSR) 6.6 Acres**

(See above write-up for Alternative 2)

- WSR 1 (4.3 AC) approx. 240 trees, 1,000 herbaceous, 500 shrubs
- WSR 2 (2.3 AC) approx. 315 trees, 1,200 herbaceous, 750 shrubs

#### **Totals:**

- Trees: 555
- Shrubs: 1,250
- Herbaceous: 2,200

#### **Tropical Hardwood Hammock (THH) 9.2 Acres**

(See above write-up for Alternative 2)

- THH 1 (1.7 AC) approx. 335 trees, 630 shrubs
- THH 2 (7.5 AC) approx. 1,465 trees, 2,775 shrubs

#### **Totals:**

- Trees: 1,800
- Shrubs: 3,405

**Dune/Coastal Stand (DCS) 3.4 Acres**

(See above write-up for Alternative 2)

- DCS 1 (2.8 AC) 'Dune' approx. 3,350 herbaceous, 75 shrubs
- DCS 2 (0.6 AC) 'Dune' approx. 720 herbaceous, 15 shrubs

**Totals:**

- Herbaceous: 4,070
- Shrubs: 90

**ALTERNATIVE 4 (Figure B-5)**

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**Tropical Hardwood Hammock (THH) 1.5 Acres**

(See above write-up for Alternative 2)

- THH 1 (1.5 AC) approx. 115 trees, 555 shrubs

**Totals:**

- Trees: 115
- Shrubs: 555

**Dune/Coastal Stand (DCS) 2.1 Acres**

(See above write-up for Alternative 2)

- DCS 1 (2.1 AC) approx. 2,540 herbaceous, 60 shrubs

**Totals:**

- Herbaceous: 2,540
- Shrubs: 60

**TABLE B-1 VIRGINIA KEY SECTION 1135 - RESTORATION MANAGEMENT STRATEGY**

COVERAGE	AREA TO BE RESTORED	OVERSTORY RESTORATION	UNDERSTORY RESTORATION	TREES TO BE PLANTED (Spacing is On Center = OC)	SHRUBS TO BE PLANTED (Spacing is On Center = OC)	HERBACEOUS TO BE PLANTED (Spacing is On Center = OC)
<b>ALTERNATIVE 2</b>						
WETLD REST	0.7AC	0.15 AC (20%)	0.10 AC (20%)	30 (15' OC) 1G	65 (7.5' OC) 1G	110 (5' OC) LN
POND W/ WETLD	3.2 AC	0.65 AC (20%)	0.65 AC (20%)	110 (15' OC) 1G	150 (7.5' OC) 1G	200 (5' OC) LN
THH1	1.3 AC	0.90 AC (70%)	0.65 AC (50%)	255 (12.5' OC) 3G	480 (7.5' OC) 1G	NA
THH2	2.2 AC	1.54 AC (70%)	1.10 AC (50%)	430 (12.5' OC) 3G	815 (7.5' OC) 1G	NA
THH3	2.1 AC	1.47 AC (70%)	1.05 AC (50%)	410 (12.5' OC) 3G	775 (7.5' OC) 1G	NA
THH4	17.6 AC	12.32 AC (70%)	8.80 AC (50%)	3,435 (12.5' OC) 3G	6,520 (7.5' OC) 1G	NA
THH5	1.0 AC	0.70 AC (70%)	0.50 AC (50%)	195 (12.5' OC) 3G	370 (7.5' OC) 1G	NA
D/CS1	2.9 AC	0.73 AC (25%)	0.73 AC (25%)	80 (20' OC) 3G	NA	3,500 (3' OC) LN
D/CS2	2.5 AC	0.63 AC (25%)	0.63 AC (25%)	70 (20' OC) 3G	NA	3,020 (3' OC) LN
D/CS3	2.0 AC	0.50 AC (25%)	0.50 AC (25%)	55 (20' OC) 3G	NA	2,395 (3' OC) LN
D/CS4	0.8 AC	0.20 AC (25%)	0.20 AC (25%)	25 (20' OC) 3G	NA	960 (3' OC) LN
<b>ALTERNATIVE 2A</b>						
WETLD REST	0.7AC	0.15 AC (20%)	0.10 AC (20%)	30 (15' OC) LN	65 (7.5' OC) 1G	110 (5' OC) LN
POND W/ WETLD	3.2 AC	0.65 AC (20%)	0.65 AC (20%)	110 (15' OC) LN	150 (7.5' OC) 1G	200 (5' OC) LN
POND CREATION	2.1 AC	0.40 AC (20%)	1.60 AC (80%)	115 (15' OC) 1G	225 (7.5' OC) 1G	375 (5' OC) LN
THH1	1.3 AC	0.90 AC (70%)	0.65 AC (50%)	255 (12.5' OC) 3G	480 (7.5' OC) 1G	NA
THH2	2.2 AC	1.54 AC (70%)	1.10 AC (50%)	430 (12.5' OC) 3G	815 (7.5' OC) 1G	NA
THH3	2.1 AC	1.47 AC (70%)	1.05 AC (50%)	410 (12.5' OC) 3G	775 (7.5' OC) 1G	NA
THH4	15.5 AC	10.85 AC (70%)	7.75 AC (50%)	3,025 (12.5' OC) 3G	5,740 (7.5' OC) 1G	NA
THH5	1.0 AC	0.70 AC (70%)	0.50 AC (50%)	195 (12.5' OC) 3G	370 (7.5' OC) 1G	NA
D/CS1	2.9 AC	0.73 AC (25%)	0.73 AC (25%)	80 (20' OC) 3G	NA	3,500 (3' OC) LN
D/CS2	2.5 AC	0.63 AC (25%)	0.63 AC (25%)	70 (20' OC) 3G	NA	3,020 (3' OC) LN
D/CS3	2.0 AC	0.50 AC (25%)	0.50 AC (25%)	55 (20' OC) 3G	NA	2,395 (3' OC) LN
D/CS4	0.8 AC	0.20 AC (25%)	0.20 AC (25%)	25 (20' OC) 3G	NA	960 (3' OC) LN
<b>ALTERNATIVE 3</b>						
WETLD REST1	4.3AC	0.86 AC (20%)	0.86 AC (20%)	240 (15' OC) 1G	500 (7.5' OC) 1G	1,000 (5' OC) LN
WETLD REST2	2.3AC	1.12 AC (20%)	1.12 AC (20%)	315 (15' OC) 1G	750 (7.5' OC) 1G	1,200 (5' OC) LN
THH1	1.7 AC	1.20 AC (70%)	0.85 AC (50%)	335 (12.5' OC) 3G	630 (7.5' OC) 1G	NA
THH2	7.5 AC	5.25 AC (70%)	3.75 AC (50%)	1,465 (12.5' OC) 3G	2,775 (7.5' OC) 1G	NA
D/CS1	2.8 AC	0.70 (25%)	0.70 AC (25%)	75 (20' OC) 3G	NA	3,350 (3' OC) LN
D/CS2	0.6 AC	0.15 (25%)	0.15 AC (25%)	15 (20' OC) 3G	NA	720 (3' OC) LN
<b>ALTERNATIVE 4</b>						
THH1	1.5 AC	1.05 AC (70%)	0.75 AC (50%)	115 (12.5' OC) 3G	555 (7.5' OC) 1G	NA
D/CS1	2.1 AC	0.53 AC (25%)	0.53 AC (25%)	60 (20' OC) 3G	NA	2,540 (3' OC) LN

ACRONYMS: WETLD REST1 = Wetland Restoration 1, THH1 = Tropical Hardwood Hammock 1, D/CS1 = Dune/Coastal Strand 1 LN = 4" liner container, 1G = 1 gallon container, 3G = 3 gallon container NA = Not Applicable

**Table B-2 – RESTORATION PLANT SPECIES and INSTALLATION INFORMATION**

**Native Plant Species Suitable for Ecosystem Restoration  
Virginia Key, Florida**

<b>PLANT COMMUNITY (HABITAT)</b>	<b>SPECIES COMMON NAME</b>	<b>SPECIES SCIENTIFIC NAME, SIZE &amp; SPACING</b>
<b>Wetlands – Strand (influenced by tide) see text</b>		
	Black mangrove	<i>Avicennia germinans</i> 1 Gallon (1G) 15-foot On Center
	Red mangrove	<i>Rhizophora mangle</i> 1G 15' OC
	Gulf cordgrass	<i>Spartina spartinae</i> 4" LN 5' OC
	Juncus	<i>Juncus roemerianus</i> 4" LN 5' OC
	Myrsine	<i>Rapanea punctata</i> 1G 7.5' OC
	Palmetto	<i>Sabal palmetto</i> 1G 15' OC
<b>Wetlands – Pond (Littoral Shelf) Creation see text</b>		
	Spatterdock	<i>Nuphar lutea</i> Bare Root (BR) 5-foot On Center
	Slender cordgrass	<i>Spartina bakerii</i> 4" LN 5' OC
	Pickernelweed	<i>Pontederia cordata</i> BR 5' OC
	Spartina	<i>Spartina patens</i> 4" LN 10' OC
	Juncus	<i>Juncus roemerianus</i> 4" LN 10' OC
	Coastal spikerush	<i>Elecharis cellulosa</i> 4" LN 10' OC
<b>Pond with Wetlands – see text</b>		
	Wax myrtle	<i>Myrica cerifera</i> 1 Gallon (1G) 15-foot On Center
	Buttonbush	<i>Cephananthus occidentalis</i> 1G 15' OC
	Loblolly bay	<i>Persea palustris</i> 3G 15' OC
	Seaside seedbox	<i>Ludwigia maritima</i> 4" LN 5' OC
	Pickernelweed	<i>Pontederia cordata</i> 4" LN 5' OC
	Marsh mallow	<i>Hibiscus tiliaceus</i> 4" LN 7.5' OC
	Softrush	<i>Juncus effuses</i> 4" LN 5' OC
	Buttonwood	<i>Conocarpus erectus</i> 1G 15' OC
	Myrsine	<i>Rapanea punctata</i> 1G 7.5' OC
	Leatherleaf fern	<i>Acrostichum dangeiffium</i> 1G 15' OC
<b>Coastal Strand</b>		
	Seven year apple	<i>Genipa clusiifolia</i> 3 Gallon (3G) 20-foot On Center
	Fiddlewood	<i>Citharexylum fruticosum</i> 3G 20' OC
	Key thatch palm	<i>Thrinax morrisii</i> 7G 20' OC
	Necklace pod	<i>Sophora tomentosa</i> 3G 20' OC
	Cocoplum	<i>Chrysobalanus icaco</i> 3G 20' OC
	Saw palmetto	<i>Serenoa repens</i> 3G 20' OC
	Silver palm	<i>Coccothrinax argentata</i> 3G 20' OC
	Cabbage palm	<i>Sabal palmetto</i> 3G 20' OC
	Varnish leaf	<i>Dodonaea viscosa</i> 25G 20' OC
	Green buttonwood	<i>Conocarpus erectus</i> 3G 20' OC
	Sea grape	<i>Coccoloba uvifera</i> 3G 20' OC
	Myrsine	<i>Rapanea punctata</i> 3G 20' OC
	Island marlberry	<i>Ardisia escallonioides</i> 3G 20' OC
	Saltbush	<i>Baccharis halimifolia</i> 3G 20' OC
	Coral bean	<i>Erythrina herbacea</i> 3G 3' OC
	Beach jaquemontia	<i>Jacquemontia reclinata</i> 3G 3' OC
	Cats claw	<i>Pithecellobium unguis-cati</i> 3G 3' OC
	Blanket flower	<i>Gaillardia pulchella</i> 4" LN 3' OC
	Blackbead	<i>Pithecellobium keyense</i> 3G 3' OC
	White indigo berry	<i>Randia aculeate</i> 4" LN 3' OC

**Native Plant Species Suitable for Ecosystem Restoration  
Virginia Key, Florida**

<b>PLANT COMMUNITY (HABITAT)</b>	<b>SPECIES COMMON NAME</b>	<b>SPECIES SCIENTIFIC NAME, SIZE &amp; SPACING</b>	
<b>Dune</b>			
	Sea oat	<i>Uniola paniculata</i>	4" Liner 2-foot OC
	Sea oxeye daisy	<i>Borrichia frutescens</i>	4" LN 3' OC
	Sea lavender	<i>Argusia gnaphalodes</i>	1G 3' OC
	Salt joint grass	<i>Paspalum vaginatum</i>	4" LN 3' OC
	Sea purslane	<i>Sesuvium portulacastrum</i>	4" LN 3' OC
	Beach creeper	<i>Ernodea littoralis</i>	4" LN 3' OC
	Baker's cordgrass	<i>Spartina spp.</i>	4" LN 3' OC
	Beach elder	<i>Iva imbricata</i>	4" LN 3' OC
	Dune sunflower	<i>Helianthus debilis</i>	4" LN 3' OC
	Beach star	<i>Remirea maritima</i>	4" LN 3' OC
	Panicum grass	<i>Panicum amarum</i> Ell.	4" LN 3' OC
	Beach morning glory	<i>Ipomea pes-caprae</i>	4" LN 3' OC
	Seashore dropseed	<i>Sporobolus virginicus</i>	4" LN 3' OC
	Beach bean	<i>Canavalia maritima</i>	4" LN 3' OC
	Blanket flower	<i>Gaillardia pulchella</i>	4" LN 3' OC
	Yaupon holly	<i>Ilex vomitoria</i> Soland.	3G 20' OC
	Bay cedar	<i>Suriana maritima</i>	3G 20' OC
	Inkberry	<i>Scaevola plumieri</i>	3G 20' OC
<b>Tropical Hardwood Hammock</b>			
	Cinnecord	<i>Acacia choriophylla</i>	3 Gallon (3G) 5-foot On Center (OC)
	Stangler fig	<i>Ficus aurea</i>	3G 12.5' OC
	Gumbo limbo	<i>Bursera simaruba</i>	3G 12.5' OC
	Swamp bay	<i>Persea borbonia</i>	3G 12.5' OC
	Black ironwood	<i>Krugiodendron ferreum</i>	3G 12.5' OC
	Lignum vitae	<i>Guaiaecum sanctum</i>	3G 12.5' OC
	Satin leaf	<i>Chrysophyllum oliviforme</i>	3G 12.5' OC
	Blolly	<i>Guapira discolor</i>	3G 12.5' OC
	Pigeon plum	<i>Coccoloba diversifolia</i>	3G 12.5' OC
	Wild tamarind	<i>Lysiloma latisiliquum</i>	3G 12.5' OC
	Mastic	<i>Mastichodendron foetidissimum</i>	3G 12.5' OC
	Black torch	<i>Amyris elemifera</i>	3G 12.5' OC
	Joewood	<i>Jacquinia keyensis</i> Mez.	3G 12.5' OC
	Mahogany	<i>Swietenia mahagoni</i>	3G 12.5' OC
	Jamaica dogwood	<i>Piscidia piscipula</i>	3G 12.5' OC
	Paradise tree	<i>Simarouba glauca</i>	3G 12.5' OC
	Wild coffee	<i>Psychotria nervosa</i>	1G 7.5' OC
	Soapberry	<i>Sapindus saponaria</i>	1G 7.5' OC
	Wild lime	<i>Zanthoxylum sp.</i>	1G 7.5' OC
	Coral bean	<i>Erythrina herbacea</i>	1G 7.5' OC
	Spanish stopper	<i>Eugenia foetida</i>	1G 7.5' OC
	Wax myrtle	<i>Myrica cerifera</i>	1G 7.5' OC
	Beautyberry	<i>Callicarpa americana</i>	1G 7.5' OC
	White stopper	<i>Eugenia axillaris</i>	1G 7.5' OC
	Snowberry	<i>Chiococca alba</i>	1G 7.5' OC
	Firebush	<i>Hamelia patens</i>	1G 7.5' OC
	Florida privet	<i>Forestiera segregata</i>	1G 7.5' OC
	Jamaica caper	<i>Capparis cynophallophora</i>	1G 7.5' OC

Notes: Size is the container size the plant is grown in and installed from. Spacing is the distance from the center of one plant to the center of another plant when installed. A methodical and generous mix of plant types are required for the restoration plantings to function naturally.

**TABLE B-3 - ALTERNATIVE 2 RESTORATION SUMMARY**

Habitat Type No	DCS 1	DCS 2	DCS 3	DCS 4	THH 1	THH 2	THH 3	THH 4	THH 5	WSR	WR
Habitat Type											
POND W/ WETLAND REST. (WR) 3.2 AC											3.2 AC
WETLAND REST. (WSR) 0.7 AC										0.7 AC	
TROPICAL HARDWD HAMMOCK (THH) 24.2 AC					1.3 AC	2.2 AC	2.1 AC	17.6 AC	1.0 AC		
DUNE COASTAL STRAND REST. (DCS) 8.2 AC	2.9 AC	2.5 AC	2.0 AC	0.8 AC							

**TABLE B-4 - ALTERNATIVE 2A RESTORATION SUMMARY**

Habitat Type No.	DCS 1	DCS 2	DCS 3	DCS 4	THH 1	THH 2	THH 3	THH 4	THH 5	WR	WSR	WPC
Habitat Type												
POND W/ WETLAND REST. (WR) 3.2 AC										3.2 AC		
WETLAND REST. (WSR) 0.7 AC											0.7 AC	
POND LITTORAL SHELF CREATION (WPC) 2.1 AC												2.1 AC
TROPICAL HARDWD HAMMOCK (THH) 22.1 AC					1.3 AC	2.2 AC	2.1 AC	15.5 AC	1.0 AC			
DUNE COASTAL STRAND REST. (DCS) 8.5 AC	2.9 AC	2.5 AC	2.0 AC	0.8 AC								



**TABLE B-5 - ALTERNATIVE 3 RESTORATION SUMMARY**

Habitat Type No.	DCS 1	DCS 2	THH 1	THH 2	WSR 1	WSR 2
Habitat Type						
WETLAND RESTORATION (WSR) 6.6 AC					4.3 AC	2.3 AC
TROPICAL HARDWOOD HAMMOCK (THH) 9.2 AC			1.7 AC	7.5 AC		
DUNE COASTAL STRAND RESTORATION (DCS) 3.4 AC	2.8 AC	0.6 AC				

**TABLE B-6 - ALTERNATIVE 4 RESTORATION SUMMARY**

Habitat Type No.	DCS 1	THH 1
Habitat Type		
TROPICAL HARDWOOD HAMMOCK (THH) 1.5 AC		1.5 AC
DUNE COASTAL STRAND RESTORATION (DCS) 2.1 AC	2.1 AC	

**TABLE B-7 – ESTIMATED RESTORATION MAINTENANCE COSTS\***

Habitat Type No.	YEAR 1	YEAR 2	YEAR 3
Habitat Type			
POND W/ WETLAND RESTORATION	\$2,500/AC	\$1,800/AC	\$1,200/AC
WETLAND RESTORATION	\$2,500/AC	\$1,800/AC	\$1,200/AC
POND LITTORAL SHELF CREATION	\$1,000/AC	\$750/AC	\$500/AC
TROPICAL HARDWOOD HAMMOCK	\$1,000/AC	\$750/AC	\$500/AC
DUNE COASTAL STRAND RESTORATION	\$1,000/AC	\$750/AC	\$500/AC

\*Based on Wetland Engineering Handbook, ERDC, 2000, information, extrapolations, professional expertise

**TABLE B-8 – ESTIMATED MULCH QUANTITIES**

Tropical Hardwood Hammock Mulch Requirements II (R) 2 (0.5) ÷ 27 = CY/Plant	ALT No.2 Quantity	ALT No.2A Quantity	ALT No.3 Quantity	ALT No.4 Quantity
Total Trees (each)	4,725	4,315	1,800	115
5-foot Diameter <b>Mulch</b> Circles around Trees 6" thick (0.36) in cubic yards	1,701	1,553	648	41
Total Shrubs (each)	8,960	8,180	3,405	555
3-foot Diameter <b>Mulch</b> Circles around Shrubs 6" thick (0.13) in cubic yards	1,172	1,063	443	72
<b>Total Mulch Per Alternative (cubic yards)</b>	<b>2,873</b>	<b>2,616</b>	<b>1,091</b>	<b>113</b>

**TABLE B-9 – CONCEPTUAL RESTORATION ALTERNATIVE MAINTENANCE COSTS**

ALTERNATIVE NUMBER	YEAR 1	YEAR 2	YEAR 3	3 YEAR TOTAL	ANNUALIZED MAINTENANCE
NO ACTION 0 AC	0	0	0	0	0
ALT. 2 36.3 AC	\$42,150	\$31,320	\$20,880	\$94,350	\$31,450
ALT. 2A 36.3 AC	\$42,150	\$31,320	\$20,880	\$94,350	\$31,450
ALT. 3 19.2 AC	\$29,100	\$21,330	\$14,220	\$64,650	\$21,550
ALT 4 3.6 AC	\$3,600	\$2,700	\$1,800	\$8,100	\$2,700

Conceptual costs based on USACE, ERDC, Wetland Engineering Handbook, 2000, Vicksburg, MS.  
Minimal maintenance costs would be expected after the establishment of the restored habitats (year 3).

**TABLE B-10**  
**TROPICAL HAMMOCK**  
**ONE-ACRE PLANTING TEMPLATE**  
**NATURE CONSERVANCY**

SPECIES	RELATIVE % COVER/ STRATA	NUMBER of PLANTS/ ACRE	CONTAINER SIZE	PLANT SPACING
<u>CANOPY</u>				
<i>Bursera simaruba</i> (gumbo limbo)	7.5	33	3g	10 ft oc
<i>Coccoloba diversifolia</i> (pigeon plum)	7.5	33	3g	10 ft oc
<i>Ficus aurea</i> (strangler fig)	7.5	32	3g	10 ft oc
<i>Sabal palmetto</i> (sabal palm)	7.5	32	8-12 ft	10 ft oc
<i>Mastichodendron</i> <i>foetidissimum</i> (Mastic)	5	22	3g	10 ft oc
<i>Coccoloba uvifera</i> (sea grape)	2.5	11	3g	10 ft oc
<i>Krugiodendron ferreum</i> (black ironwood)	2.5	11	3g	10 ft oc
<i>Simarouba glauca</i> (paradise tree)	2.5	11	3g	10 ft oc
<i>Persea borbonia</i> (redbay)	1.25	5	3g	10 ft oc
<i>Quercus virginiana</i> (live oak)	1.25	5	3g	10 ft oc
other	5	22	3g	10 ft oc

SPECIES	RELATIVE % COVER/ STRATA	NUMBER of PLANTS/ ACRE	CONTAINER SIZE	PLANT SPACING
<u>SUBCANOPY</u>				
<i>Eugenia axillaris</i> (white stopper)	7.5	33	3g	10 ft oc
<i>Eugenia foetida</i> (Spanish stopper)	7.5	33	3g	10 ft oc
<i>Guapira discolor</i> (blolly)	7.5	32	3g	10 ft oc
<i>Ocotea coriacea</i> (lancewood)	7.5	32	3g	10 ft oc
<i>Zanthoxylum fagara</i> (wild lime)	7.5	32	3g	10 ft oc
<i>Chrysophyllum oliviforme</i> (satinleaf)	2.5	11	3g	10 ft oc
<i>Bumelia salicifolia</i> (willow bustic)	2.5	10	3g	10 ft oc
<i>Drypetes lateriflora</i> (guiana plum)	2.5	10	3g	10 ft oc
other	5	22	3g	10 ft oc
<u>SHRUB</u>				
<i>Ardisia escallonoides</i> (marlberry)	15	260	1g	5 ft oc
<i>Capparis cynophallophora</i> (Jamaica caper)	15	260	1g	5 ft oc
<i>Citharexylum fruticosum</i> (fiddlewood)	15	260	1g	5 ft oc

SPECIES	RELATIVE % COVER/ STRATA	NUMBER of PLANTS/ ACRE	CONTAINER SIZE	PLANT SPACING
<i>Myrsine floridana</i> (myrsine)	15	260	1g	5 ft oc
<i>Psychotria nervosa</i> (wild coffee)	15	260	1g	5 ft oc
<i>Randia aculeata</i> (indigo berry)	15	260	1g	5 ft oc
<i>Forestiera segregata</i> (wild olive)	5	87	1g	5 ft oc
other	5	87	1g	5 ft oc

NOTES: Australian pine mulch @ 3 inches thick = 400 cu yds per acre

Estimated costs for plants:

1734 1g @\$2 each	= \$ 3,468.00
400 3g @\$5 each	= \$ 2,000.00
32 8-12ft @\$63 each	= \$ 2,016.00

Total estimated plant cost	= \$ 7,484.00
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Total estimated cost for plants, delivery and installation	= \$14,968.00
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**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX C**

**Economics**

**U.S. Army Engineer District**  
**Jacksonville, Florida**

## Appendix C Economic Analysis

### Virginia Key, Miami-Dade County, Florida Section 1135 Study

#### General

This section of the appendix includes a brief description of the demographics and economy of the study area, which is Miami-Dade County. The largest city in the county is Miami. For a description of the economy to be relevant, it needs to show how the study area relates to the State of Florida and the U.S. Table C-1 and table C-2 below provide insight into the study area's socio-economic characteristics. The population of Miami-Dade County was over 2.2 million persons in 2000. The population of Florida and Miami-Dade County are growing at a faster rate than the United States.

Table C –1  
Population and Housing

	Miami-Dade County	Florida	USA
Population, 2000	2,253,362	15,982,378	281,421,906
Population, percent change, 1990 to 2000	16.30%	23.50%	13.10%
Persons under 5 years old, percent, 2000	6.50%	5.90%	6.80%
Persons under 18 years old, percent, 2000	24.80%	22.80%	25.70%
Persons 65 years old and over, percent, 2000	13.30%	17.60%	12.40%
White persons, percent, 2000 (a)	69.70%	78.00%	75.10%
Black or African American persons, percent, 2000 (a)	20.30%	14.60%	12.30%
Asian persons, percent, 2000 (a)	1.40%	1.70%	3.60%
Persons reporting some other race, percent, 2000 (a)	4.60%	3.00%	5.50%
Persons reporting two or more races, percent, 2000	3.80%	2.40%	2.40%
Female persons, percent, 2000	51.70%	51.20%	50.90%
Persons of Hispanic or Latino origin, percent, 2000 (b)	57.30%	16.80%	12.50%
White persons, not of Hispanic/Latino origin, percent, 2000	20.70%	65.40%	69.10%
High school graduates, persons 25 years and over, 1990	833,013	6,616,094	119,524,718
College graduates, persons 25 years and over, 1990	240,460	1,624,405	32,310,253
Housing units, 2000	852,278	7,302,947	115,904,641
Homeownership rate, 2000	57.80%	70.10%	66.20%
Households, 2000	776,774	6,337,929	105,480,101

Persons per household, 2000	2.84	2.46	2.59
Households with persons under 18, percent, 2000	39.00%	31.30%	36.00%

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments.

**Table C-2**  
**Economy and Income**

	<b>Miami-Dade County</b>	<b>Florida</b>	<b>USA</b>
Median household money income, 1997 model-based estimate	\$30,000	\$32,877	\$37,005
Persons below poverty, percent, 1997 model-based estimate	21.10%	14.40%	13.30%
Children below poverty, percent, 1997 model-based estimate	29.60%	21.80%	19.90%
Private nonfarm establishments, 1999	66,547	424,089	7,008,444
Private nonfarm employment, 1999	863,254	5,954,982	110,705,661
Private nonfarm employment, percent change 1990-1999	13.70%	29.30%	18.40%
Nonemployer establishments, 1998	181,436	987,458	15,708,727
Manufacturers shipments, 1997 (\$1000)	8,523,906	77,477,510	3,842,061,405
Retail sales, 1997 (\$1000)	20,720,567	151,191,241	2,460,886,012
Retail sales per capita, 1997	\$9,718	\$10,297	\$9,190
Minority-owned firms, percent of total, 1997	58.20%	22.00%	14.60%
Women-owned firms, percent of total, 1997	23.60%	25.90%	26.00%
Housing units authorized by building permits, 2000	12,475	155,269	1,592,267
Federal funds and grants, 2000 (\$1000)	11,635,851	92,776,372	1,623,475,453
Local government employment - full-time equivalent, 1997	87,062	543,525	10,227,429
<b>Geography QuickFacts</b>	<b>Miami-Dade County</b>	<b>Florida</b>	<b>USA</b>
Land area, 2000 (square miles)	1,946	53,927	3,537,441
Persons per square mile, 2000	1,157.90	296.4	79.6

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments.



### **Cost Effectiveness and Incremental Cost Analyses**

Cost effectiveness and incremental cost analyses reveal information about good financial investments given the dollar costs and non-dollar outputs ("benefits") of alternative investment choices. The analyses are conducted in a series of steps that progressively identify alternatives that meet specified criteria and screen-out those that do not. Engineering Regulation 1105-2-100 (The Planning Guidance Notebook) provides economic evaluation procedures to be used in all Federal water resources planning studies. The guidelines specified in the ER 1105-2-100 dated 22 April 2000 were observed in preparing this report. Corps Engineer Regulation 1105-2-100 requires cost effectiveness and incremental cost analyses to support recommendations for ecosystem restoration.

Cost effectiveness analysis begins with a comparison of the costs and outputs of alternative plans to identify the least cost plan for every possible level of output. The resulting least cost alternative plans are then compared to identify those that will produce greater levels of output at the same cost, or at a lesser cost, as other alternative plans. Alternative plans identified through this comparison are the cost effective alternative plans. Next, the cost effective alternative plans are compared to identify the most economically efficient alternative plans, that is, the "best buy" alternative plans that will progressively produce the "biggest bang for the buck". Finally, the additional costs for the additional amounts of output ("incremental cost") produced by the best buy alternative plans are calculated.

Each alternative restoration plan was characterized in terms of implementation costs and expected benefits. Costs represent the difference between conditions without any plan or alternative (the "base condition", or "without-project condition") and with a plan or alternative. For purposes of this report and analysis, NED costs (National Economic Development Costs, as defined by Federal and Corps of Engineers policy), are expressed using the federally mandated project evaluation interest rate of 5.375 percent. The economic period of analysis of 50 years and FY 2005 prices were used to evaluate economic feasibility of the recommended plan. The cost effectiveness and incremental cost analyses used FY 2004 cost. Costs of a plan represent the value of goods and services required to implement and operate/maintain the plan.

Data for initial construction/implementation, monitoring, and periodically recurring costs for OMRR&R (operation, maintenance, repair, replacement, and rehabilitation), have been developed through engineering design and cost estimation efforts. Details of that data development are explained and discussed elsewhere in this report. The main issues requiring economic evaluation attention include equivalent time basis calculations, price levels, timing of project spending, and computation of average annual cost.

The timing of a plan's costs is important. Construction and other initial implementation costs cannot simply be added to periodically recurring costs for

project operation, maintenance, and monitoring. Also, construction costs incurred in a given year of the project can't simply be added to construction costs incurred in other years if meaningful and direct comparisons of the costs of the different alternatives are to be made. A common practice of equating sums of money across time with their equivalent at an earlier single point in time is the process known as discounting. Through this mathematical process, which involves the use of an interest rate (or discount rate) officially prescribed by Federal policy for use in water resource planning analysis (currently set at 5.375% per year), the cost time streams of each alternative are mathematically translated into a equivalent time basis value.

Engineering Regulation (ER) 1105-2-100 requires that interest during construction (IDC) be computed which represents the opportunity cost of capital incurred during the construction period. Interest was computed for construction costs from the middle of the month in which the expenditures were incurred until the first of the month following the estimated construction periods for each alternative as defined in Table C-3. The cost of a project is the investment incurred up to the beginning of the period of analysis. The investment cost at that time is the sum of construction and PED cost plus interest during construction. For each of the alternatives total implementation costs were calculated and average annual equivalent costs (based on a 50-year project life, using a 5.375 percent discount rate, and FY 2004 price levels) were derived. The current FY 2005 price levels were used for the recommended plan. Table C-3 summarizes the average annual cost for each of the alternatives that were used in the cost effectiveness and incremental cost analyses.

Table C-3  
Summary of Costs  
(2004 dollars)

Without Recreation component

Cost Categories	Alternative 2	Alternative 2A	Alternative 3	Alternative 4	Alternative 2+3	Alternative 2A + 3	Alternative 2 + 3 + 4	Alternative 2A + 3 + 4	Alternative 3 + 4
Habitat Units	28.10	27.26	14.87	2.99	42.97	42.13	45.96	45.12	17.86
Initial Construction Cost	1,146,300	1,220,200	512,400	96,600	1,658,600	1,732,500	1,755,000	1,829,000	608,900
Real Estate Cost	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>	<u>27,500</u>
Total Initial Cost	1,173,800	1,247,700	539,900	124,100	1,686,100	1,760,000	1,782,500	1,856,500	636,400
Interest during Const. Total	<u>9,700</u>	<u>13,846</u>	<u>3,174</u>	<u>697</u>	<u>22,754</u>	<u>27,978</u>	<u>32,627</u>	<u>38,460</u>	<u>6,791</u>
Investment	1,183,500	1,261,546	543,074	124,797	1,708,854	1,787,978	1,815,127	1,894,960	643,191
Interest & Amortization OMRR&R Total	68,620	73,145	31,488	7,236	99,080	103,668	105,242	109,871	37,293
Average Annual	<u>27,110</u>	<u>27,110</u>	<u>15,330</u>	<u>2,090</u>	<u>42,440</u>	<u>42,440</u>	<u>44,530</u>	<u>44,530</u>	<u>17,420</u>
Annual	95,730	100,255	46,818	9,326	141,520	146,108	149,772	154,401	54,713
Construction Time Months	3	4	2	1.5	5	6	6.5	7.5	3.5



The benefits of each of the alternatives were characterized in terms of habitat units that serve as a quantitative expression of environmental output. For each alternative, the expected number of habitat units to occur in the future in the absence of the restoration project was subtracted from the number of habitat units expected to occur with the restoration project. That difference in habitat units (between "with" and "without project" conditions) represents the "benefits" due to restoration. A more detailed explanation in the derivation of habitat units can be found in the Environmental Assessment. The average annual equivalent cost and benefits (habitat units) from table C-3 were used to conduct cost effectiveness and incremental cost analyses (CE/ICA). IWR-PLAN Decision Support software version 3.33, April 2003 was used for the analyses. For this analysis, all the alternatives analyzed were fully formulated mutually exclusive alternative plans.

"Cost effective" means that, for a given level of environmental output (habitat units), no other plan cost less. Similarly, no other plan yields more habitat units for less money. Cost effective analysis indicates that, seven alternative restoration plans, including the No Action alternative, are cost effective. These cost effective plans range from implementation of Alternative 4 (producing 2.99 habitat units at a cost of \$9,326) to the most expensive plan. Table C-4 displays the average cost of all alternatives. The cost effective plans are indicated with "Y" in the cost effective column.

**Table C-4**  
**Average Cost of All Alternatives**

Alternatives	Cost Effective	Habitat Units (HU)	Total Annual Cost (\$)	Avg. Cost Per Habitat Unit (\$)
No Action	Y	0.00	\$0	\$0
4	Y	2.99	\$9,326	\$3,124
3	Y	14.87	\$46,818	\$3,148
3+4	Y	17.86	\$54,713	\$3,064
2	Y	28.10	\$95,730	\$3,407
2A		27.26	\$100,255	\$3,678
2+3	Y	42.97	\$141,520	\$3,293
2A+3		42.13	\$146,108	\$3,468
2+3+4	Y	45.96	\$149,772	\$3,259
2A+3+4		45.12	\$154,401	\$3,422

After conducting cost effectiveness analysis, incremental cost analysis examines the changes in costs and changes in environmental units (habitat units) for each

additional increment of output. The first step is, starting from No Action, to calculate the incremental change in costs and the incremental change in outputs of moving from No Action to each of the cost effective plans. The change in costs, divided by the change in outputs, is calculated to generate an average cost per unit of output for each of the cost effective plans. IWR-PLAN identifies the subset of a scenario's cost effective plans that are superior financial investments, called "best buys", through incremental cost analysis. Best buys are the most efficient plans at producing the output variable (habitat units) that provide the greatest increase in the value of habitat units for the least increase in the value of the cost parameter variable (dollars). The first best buy is the most efficient plan, producing output at the lowest incremental cost per unit. If a higher level of output is desired than that provided by the first best-buy, the second best buy is the most efficient plan for producing additional output, and so on. The plan with the lowest overall average cost per unit of output is the first "Best Buy" plan. For habitat assessment, the alternative with the lowest overall average cost is implementing Alternative 3 and 4 at \$3,064.

After the first Best Buy plan is identified, subsequent incremental analyses calculate the change in costs and change in outputs of moving from the first Best Buy to all remaining and larger cost effective plans. Again, changes in costs are divided by changes in outputs for each increment to identify the plan with the next lowest incremental cost per unit of output. The plan thus identified is the second Best Buy plan, and the process continues. This analysis produced two Best Buy plans. Table C-5 summarizes information from the incremental analysis. Figure C-1 presents a graphical representation of all the alternatives and labels the non-cost effective, cost effective and best buy alternatives. Figure C-2 presents the incremental cost for the Best Buy plans using data from table C-5.

**Table C-5**  
**Incremental Cost of the Best Buy Alternatives**

Alternative	Habitat Units (HU)	Total Annual Cost (\$)	Average Cost (\$) Per Habitat Unit	Inc. Cost \$	Inc. Output	Inc. cost Per Output
3 and 4	17.85	54,712.60	3,064.27	54,712.61	17.855	3,064.27
2, 3 and 4	45.95	149,772.19	3,259.11	95,059.59	28.100	3,382.90

Figure C-1  
All Plans  
Average Annual Cost  
(2004 dollars)

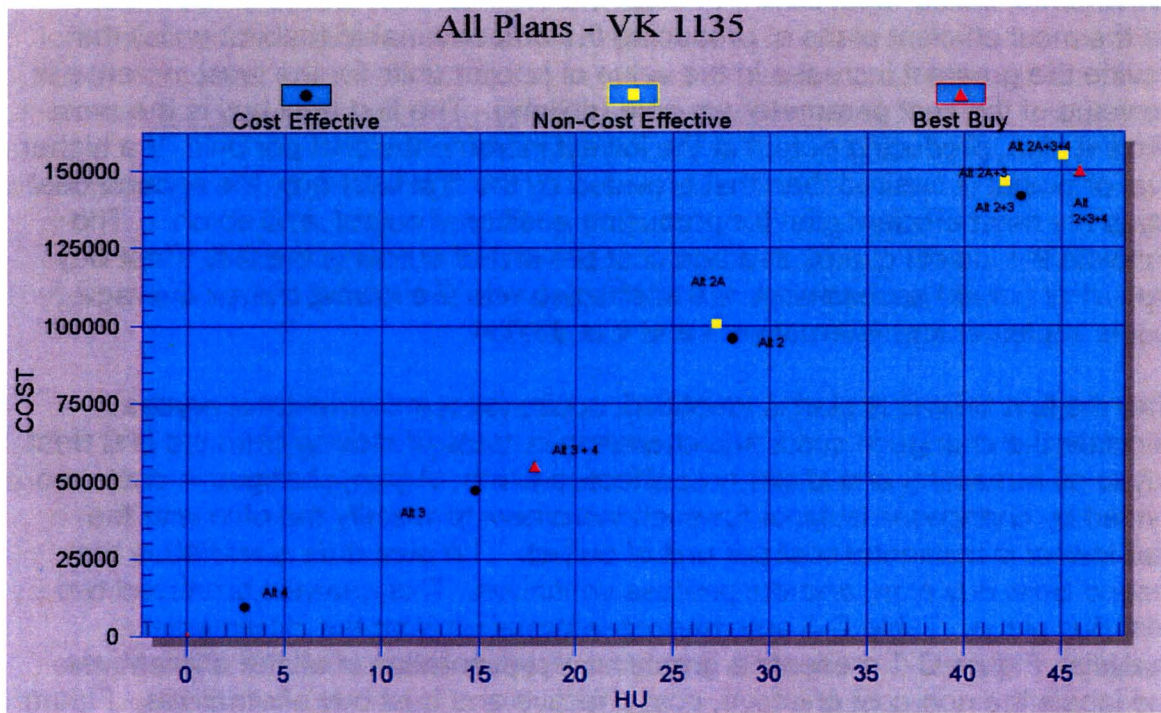
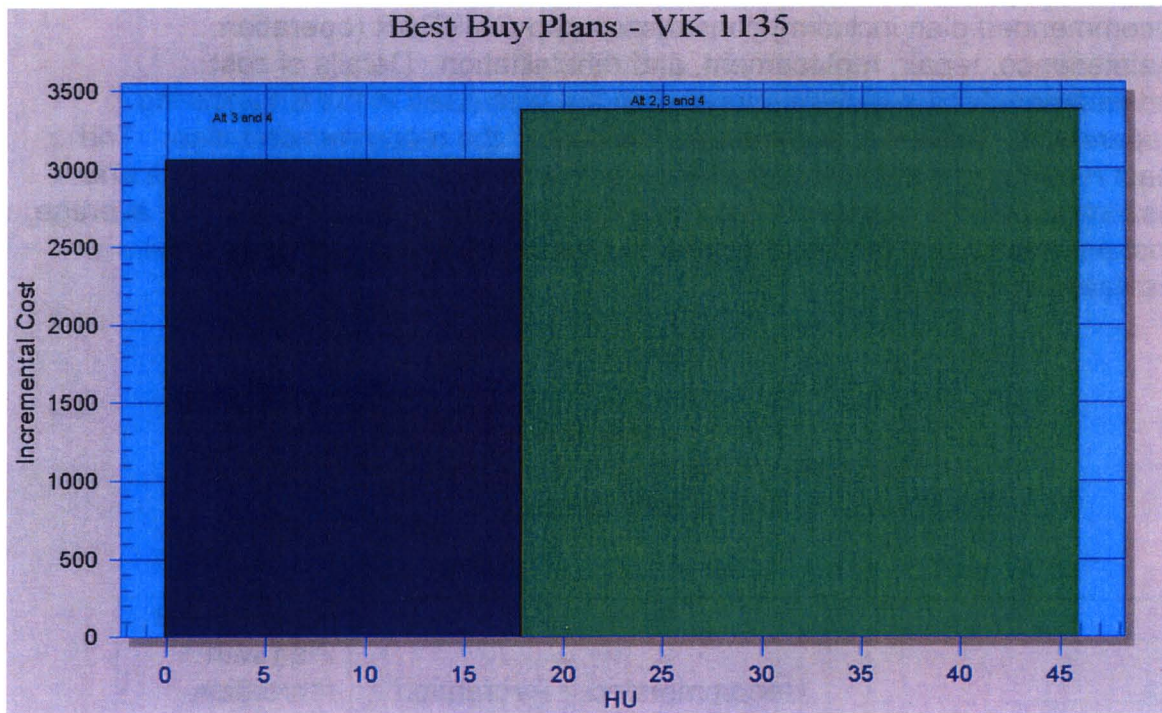


Figure C-2



### Recommend Plan

The recommended plan is the combination of Alternatives 2, 3, and 4. A discussion of the selection of the recommended plan can be found in the main report. Current FY 2005 price levels were used for all costs associated with the recommended plan including construction and OMRR&R (operation, maintenance, repair, replacement, and rehabilitation). Details of cost development for the recommended plan are discussed in the Engineering Appendix A. Table C-6 summarizes the cost of the recommended plan. The main report and the Recreation Resource Appendix E discuss the details and justification for the recreation component of the Virginia Key 1135. The average cost per habitat unit for the recommend plan in 2005 dollars is \$4,058 as displayed in Table C-7.

Table C-6  
Summary of cost for the Recommended Plan  
(2005 dollars)

	Recommended Plan	Recreation Component	Recommend Plan with recreation component
Initial Construction	2,039,500	126,500	2,166,000
Real Estate Cost	27,500	0	<u>27,500</u>
Total Initial Cost	2,067,000	126,500	2,193,500
IDC	38,800	2,000	<u>40,800</u>
Total Investment Cost	2,105,800	128,500	2,234,300
Interest and Amortization	122,100	7,400	129,500
OMRR&R	64,400	18,700	<u>83,100</u>
Average Annual	186,500	26,100	212,600

Table C-7

Recommended Plan  
Average Cost per Habitat Unit  
(2005 dollars)

Habitat Units (HU)	Total Annual Cost (\$)	Avg. Cost Per Habitat Unit (\$)
45.95	186,500	4,058

**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX D**

**Real Estate**

**U.S. Army Engineer District**  
**Jacksonville, Florida**



## TABLE OF CONTENTS

1. STATEMENT OF PURPOSE. ....	3
2. PROJECT AUTHORIZATION.....	3
3. PROJECT LOCATION.....	3
4. PROJECT DESCRIPTION. ....	3
5. REAL ESTATE REQUIREMENTS.....	3
6. FEDERAL OWNED LANDS. ....	4
7. NON-FEDERALLY OWNED LANDS.....	4
8. STANDARD ESTATE.....	4
9. NAVIGATION SERVITUDE.....	4
10. INDUCED FLOODING.....	4
11. REAL ESTATE BASELINE COST ESTIMATE.....	4
12. RELOCATION ASSISTANCE BENEFITS (Public Law 91-646). ....	5
13. MINERALS. ....	5
14. NON-FEDERAL SPONSOR'S AUTHORITY TO PARTICIPATE.....	5
15. REAL ESTATE MILESTONES. ....	5
16. RELOCATIONS OF ROADS, BRIDGES, UTILITIES, TOWN AND CEMETERIES..	5
17. PRESENCE OF CONTAMINENTS (HAZARDOUS, TOXIC AND RADIOACTIVE WASTES). ....	5
18. ATTITUDE OF LANDOWNERS .....	5
19. M-CACES:.....	6
20. Map.....	6

**VIRGINIA KEY 1135  
ECOSYSTEM RESTORATION REPORT  
MIAMI-DADE COUNTY, FLORIDA**

**1. STATEMENT OF PURPOSE.**

This Real Estate Plan is tentative in nature for planning purposes only and both the final real property acquisition lines and real estate cost estimates provided are subject to change even after approval of the Section 1135 Ecosystem Restoration Report.

**2. PROJECT AUTHORIZATION.**

This Ecosystem Restoration study was authorized under the Section 1135 of the Water Resources Development Act (WRDA) of 1986, (Public Law P.L. 99-662), as amended by WRDA 1990.

**3. PROJECT LOCATION.**

Virginia Key is a barrier island located along Eastern Biscayne Bay on the Atlantic coast of Miami - Dade County Florida. It is located south of Miami Beach and north of Key Biscayne, Florida.

**4. PROJECT DESCRIPTION.**

The proposed project includes removing all exotic vegetation and then restoring approximately 3.2 acres of pond with wetlands, 7.3 acres of wetlands, 13.7 acres of dune/coastal strand and 34.9 acres of tropical hardwood. Total acreage of restoration is 59.10 acres.

**5. REAL ESTATE REQUIREMENTS.**

The proposed project is to be constructed within the public park area, which the project sponsor has already acquired in fee. Access to the project will be by public roadways.

Some debris removed will be disposed of in an existing upland navigation disposal site north of the project area, which the Federal Government has navigational servitude rights over the site.

The values of these lands are not included in the total project costs because it is used as a public park and the fair market value is considered minimal.

## **6. FEDERAL OWNED LANDS.**

There are no Federal owned lands associated with this project.

## **7. NON-FEDERALLY OWNED LANDS.**

The lands within the proposed project area are owned by the City of Miami and the State of Florida.

## **8. STANDARD ESTATE.**

### **FEE**

The fee simple title to (the land described in Schedule A) (Tracts Nos. \_\_\_\_, \_\_\_\_, and \_\_\_\_), subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

## **9. NAVIGATION SERVITUDE.**

Navigation servitude will be exercised over the existing upland disposal area located on the north end of Virginia Key. This area was created by the Corps (Tract 100E-4, temporary disposal area, expired 4/21/1966) and is/was used for the dredging material from the Miami Harbor Navigation Project. This project will not interfere with the Navigation project.

## **10. INDUCED FLOODING.**

There will be no induced flooding directly associated with this project.

## **11. REAL ESTATE BASELINE COST ESTIMATE.**

### **Lands and Damages:**

Total Lands and Damages	\$ 0
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Project Planning	\$10,000
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Land Certification Review	\$ 2,000
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### **Acquisition/Administrative Costs:**

Non-Federal	\$10,000
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Contingency (25%)	<u>\$ 5,500</u>
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Total Costs	\$27,500
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**12. RELOCATION ASSISTANCE BENEFITS (Public Law 91-646).**

No person(s) or business(es) will be displaced as a result of this project.

**13. MINERALS.**

No known minerals exist in the project area.

**14. NON-FEDERAL SPONSOR'S AUTHORITY TO PARTICIPATE.**

The City of Miami Dade is empowered by Chapter 10847, Section 3(f, g). Such powers include the authority to make contracts and enter into agreements, to acquire and hold lands and property by any lawful means, to exercise the power of eminent domain, and to construct, acquire, operate and maintain shore protection works and facilities. The City of Miami has the authority to tax property or issue bonds to meet the costs of the city beach and shore preservation program.

**15. REAL ESTATE MILESTONES.**

The restoration lands are already acquired and will be certified by the local sponsor after the Project Cooperation Agreement (PCA) is executed. Disposal site is already available via Navigational Servitude.

**16. RELOCATIONS OF ROADS, BRIDGES, UTILITIES, TOWN AND CEMETERIES.**

There are no known utilities, roads, highways or railroads that will require relocation.

**17. PRESENCE OF CONTAMINENTS (HAZARDOUS, TOXIC AND RADIOACTIVE WASTES).**

An environmental assessment was performed by the Jacksonville District, U.S. Army Corps of Engineers, and no contaminants were present.

**18. ATTITUDE OF LANDOWNERS**

The non-federal sponsor owns the park area and is very supportive of this project.

## **19. M-CACES:**

### **ESTIMATED PROJECT REAL ESTATE COSTS**

**PROJECT:** VIRGINIA KEY 1135  
ECOSYSTEM RESTORATION REPORT

**DATE** 3 APRIL 2006

01	LANDS AND DAMAGES	\$0
01AA	PROJECT PLANNING	\$10,000
01B--	ACQUISITIONS	
01B20	BY LOCAL SPONSOR (LS)	\$10,000
01B40	REVIEW FED	\$ 2,000

<b>TOTAL PROJECT REAL ESTATE COST W/O CONT.</b>	<b>\$22,000</b>
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<b>CONTINGENCY (25%)</b>	<b>\$ 5,500</b>
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<b>TOTAL PROJECT REAL ESTATE COST WITH CONT.</b>	<b>\$27,500</b>
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## **20. Map.**

See main report, Figure 12.

**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX E**  
**Recreation Resources**

**U.S. Army Engineer District**  
**Jacksonville, Florida**

## **APPENDIX E RECREATION RESOURCE APPENDIX**

### **Virginia Key, Miami-Dade County, Florida Section 1135 Study**

#### **AUTHORIZATION**

The Virginia Key Section 1135 was authorized by Section 1135 of the Water Resources Development Act of 1986 (WRDA 86). This Act authorized the U. S. Army Corps of Engineers (Corps) to undertake environmental improvements to former Corps projects. The Federal Water Project Recreation Act (P.L. 89-72) and the Water Resources Development Act of 1986 (P.L. 99-662) provide additional guidance.

Additional authorization and guidance for the proposed ancillary recreation resources development is contained in CECW-AG, 11 June 1998 Memorandum, Policy Guidance Letter No. 59, Recreation Development at Ecosystem Restoration Projects and EP 1165-2-502, 30 Sep 1999, Checklist of Facilities Which May Be Cost Shared as Part of Recreation Development at Ecosystem Protection and Restoration Projects. Despite austere budgets and policy requirements, recreational developments can and do contribute to community health and well-being (CECW, 1998). The recreation resources proposed as part of the Virginia Key Section 1135 Environmental Restoration Report comply with the philosophy and inclusion of the CECW checklist, are economically justified and fall within the ten percent rule.

#### **BENEFIT CATEGORIES**

##### **Study Area**

The study area for the recreation benefit analysis is specific to the City of Miami in Miami-Dade County, Florida. The 2000 Draft Florida Statewide Comprehensive Outdoor Recreation Plan (SCORP) identifies the proposed project area as part of Region XI comprised of Broward, Dade and Monroe Counties. Recreation deficits identified by the SCORP for this region include; bicycle riding, hiking, freshwater and saltwater beach activities and freshwater fishing. The population growth of south Florida will only add to the projected existing recreation deficits. Regional population figures and future population estimates were not factored into Tables E-3 and E-4 because the additional figures would display extreme recreation deficits that in all probability would not be accurate. The proposed ancillary recreation resources study area (Figure E-1) is within the project study area on Virginia Key, Miami-Dade County, Florida, just northeast of the Rickenbacker Causeway.

##### **Methodology**



For the purposes of benefit estimation the capacity method was used to determine the annual recreation days that could be expected at the proposed recreation facilities. Instantaneous capacity factors, daily turnover rates, and weekend verses weekday recreation patterns were used to determine annual visitation. In this region of Florida minor seasonality influence of recreation participation is factored into the capacity equation of outdoor use.

Annual use of the Virginia Key recreation resources was calculated as a combination of existing, increased and multi-use recreation. Recreation use was then related to the surrounding proposed project area. The proposed Virginia Key recreation resources were considered to be a quality recreation resource in determining recreation values. Growth to 193,200 recreation days, or full capacity, was assumed over the project's 50-year life. This represents a potential not actual figure and is an upper use carrying capacity limit. Some potential activities were not specified, quantified or added to the total recreation days. The Virginia Key Section 1135, proposed ancillary recreation resources represent a unique opportunity for recreation resources to build upon the ecosystem restoration objective and take advantage of restored resources rather than distract from them. The ancillary recreation resources proposed would coincide with Miami-Dade Department of Environmental Resources Management (DERM) Virginia Key Restoration and Recreation Master Plan. No economic recreation demand potential analysis was undertaken for the proposed ancillary recreation resources.

A unit day value was assigned to the recreation experience at the proposed regional recreation area (with and without project). The value was based on Table E-1 of the Virginia Key, Section 1135, Environmental Restoration Report, which originates from guidance in ER 1105-2-100, page 6-133, Table 6-29. The Table 6-29 criteria and judgment factors were based on the specific judgment factors compared to with and without project conditions. These values, based on characteristics of the proposed facilities, competitive facilities within the market area, carrying capacities, accessibility and potential environmental experience, are summarized in Table E-1 on the following page.

**TABLE E-1****Virginia Key, Section 1135**

<b>CRITERIA/JUDGEMENT FACTORS</b>	<b>POINT VALUES</b>	
	With project/without	
A. Recreation Experience: 1.75 miles of multi-use crushed shell trail for interpretive/ nature study; jogging; walking; bicycling with the restored project ecosystems, ecotones and historical habitat improvements.	8	3
B. Availability of Opportunity: 1.75 miles of multi-use, recreation opportunity; saltwater beach and shoreline fishing w/enhanced environmental habitat; uncommon interpretive experience.	6	3
C. Carrying Capacity: Adequate regional facilities proposed – few existing with interpretive features at this time.	7	3
D. Accessibility: Controlled access via two main entrances off of Rickenbacker Causeway (Toll road).	11	10
E. Environmental Quality: Wildlife habitat restoration proposed (dune, wetland, tropical hardwood hammock) to provide a high quality historic environment for public within metropolitan Miami-Dade County.	8	4
<b>Virginia Key Proposed Recreation Resources Total Points</b>	<b>40</b>	<b>23</b>
Points Conversion to Dollars (FY 05):	\$5.80	\$4.23

Point value assignments for Table E-1 above are based on ER 1105-2-100, page 6-113, Table 6-29. The Table 6-29 Criteria and Judgment Factors for General Recreation were specifically used as the basis of the estimated point values for the proposed recreation area. Judgment Factors were reviewed after several site visits and coordination with local agencies. The following selection factors were used for the criteria outlined in Table E-1.

\* The Virginia Key Section 1135 proposed recreation resources would provide an area specific, unique recreation opportunity afforded by the project setting on the Biscayne Bay and Atlantic Ocean. The island offers solitude and a very tropical setting in a growing metropolitan area, and would provide specific recreation amenities (as outline in Table E-1, part A.) for expanding local population increasing demands. The environmental restoration components (dune, wetland tropical hardwood hammock) could help to ameliorate the hot summer sun and improve environmental resources for the region on project lands. The point value rating is estimated in the middle to lower end of the judgment factor scale because of the general activities that would sustain a regional use in the metropolitan Miami-Dade area. The without project values are

based on the existing site conditions, use at this time, and the Criteria/Judgment Factors for the General Recreation as described in Table 6-29 of ER 1105-2-100.

\* The availability of opportunity rating is based upon current local recreation facilities near the project area in the proposed recreation resource location. A 25-mile radius around the proposed project area represents a fairly dense urban population. A 50-mile radius would include the Everglades and a couple of other regional parks with similar resources. The proposed multi-use trail, environmental interpretation and saltwater beach will provide unique opportunities in the environmentally restored project area. The proposed recreation resources will help to provide facilities for current and projected statewide Region XI deficits.

\* The proposed Virginia Key Environmental Restoration Project recreation resources carrying capacity point values are estimated to improve with the recreation component construction. The general recreation values are based on the optimum use of the site potential, without overuse of the proposed recreation resources. Good water resources (Biscayne Bay) and access to them for non-boat fishing, environmental interpretation, beach activities and birdwatching comprise a large part of the projected recreation resources use. Peak use is conservatively projected to occur during half of the calendar year.

\* The accessibility rating is based upon the availability of local highways, roads and streets in good condition that would provide access to the proposed recreation facilities. Direct routes from the Rickenbacker Causeway provide good area access.

\* The environmental quality rating is based upon the existing aesthetic values of the proposed Virginia Key recreation resource facilities and the ease of correcting any limiting aesthetic factors. The proposed site possesses good aesthetic resources given that the area has been closed for sometime and requires facility repair and maintenance. The best aesthetics of the proposed project area are views from the beach to Biscayne Bay and the Atlantic Ocean. The environmental quality of the site will be improved by the Section 1135 Restoration Project before the recreation component has been completed. The habitat restoration materials would help to ameliorate the hot summer sun conditions within the recreation area. Thus the increase in point values within the same judgment column.

Using the guidelines for Assigning Points for the General Recreation in Table E-1, the value of a day of general recreation at the proposed Virginia Key, Section 1135 Environmental Restoration Project, recreation facilities, was determined for each project activity. The points were then converted to dollar values using conversion factors included in the Economic Guidance Memorandum EGM 05-05, Unit Day Values for Recreation, Fiscal Year 2005.

**TABLE E-2  
USER PARTICIPATION  
DESIGN DAY CAPACITY METHOD**

ACTIVITY	# OF UNITS	DAILY TURNOVER RATE	INSTANTANEOUS CAPACITY/UNIT	DESIGN DAY LOAD
Multi-Use Trail	1.75 miles	2	20/mi	70
Birdwatching	60 acres	2	4/ea.	480#
Saltwater				
Non-Boat Fishing@	1.75 miles	2	1/ea.	1814#
Interpretive Features	8 signs	6	2.5	120
▽ Saltwater Beach	2,100 LF	2	25/LF	105,000
<b>TOTAL</b>				<b>2,484</b>

2,484 / 1.5\* = 1,656 (TOTAL USER DAYS/DESIGN DAY) WITH the PROJECT

\* Denotes adjustment for multiple use

(Multiple use is visitor use of more than one facility per visit)

▽ Denotes SCORP 2000 values for recreation activities on saltwater beaches in Florida (based on linear feet). This value will not be used in the calculations as it would completely skew the following table outcomes, annual user days values and visitation values. Beach activities include walking, swimming, sunbathing, beachcombing and a myriad of other activities.

# Denotes general recreation without the project (see Table 3).

@ Saltwater non-boat fishing is based on one person per ten linear feet, or 928 increments in 1.75 miles.

**TABLE E-3  
RECREATION VALUE  
WITHOUT PROJECT**

ACTIVITY	ANNUAL USER DAYS	UNIT DAY VALUE	ANNUAL ACTIVITY VALUE
General Recreation	178,383	\$4.23	\$754,560
Total recreation Value Without Project (rounded)			\$754,600

The annual user days were calculated with the point values for the "without project" in Table E-1 and a portion of the design day load in Table E-2. This portion represents the value assigned to the "without project condition" for the activities designated by the # symbol in Table E-2.

(#1,529 (35) / 0.6 / 0.5 = 178,383 Annual User Days (without the project)

(35) equals the weekend days and holidays in the peak visitation time period (mid-May to mid-September)

0.6 is the proportion of peak use expected on weekend days

0.5 is the proportion of annual use expected during this time

# Denotes total general recreation without the project design day load value

**TABLE E-4  
RECREATION BENEFITS**

<b>ACTIVITY</b>	<b>ANNUAL USER DAYS</b>	<b>UNIT DAY VALUE</b>	<b>ANNUAL ACTIVITY VALUE</b>
General Recreation Total With *Project Value	193,200	\$5.80	\$1,120,600
Less Recreation Value: (Without Project)	178,383	\$4.23	\$754,600
Net Annual Recreation Benefits With Project (rounded)			\$366,000

(1,656)(35) / 0.6 / 0.5 = 193,200 Annual User Days (with the project)

(35) equals the weekend days and holidays in the peak visitation period (mid-May to mid-September)

0.6 is the proportion of peak use expected on weekend days

0.5 is the proportion of annual use expected during this time

Methodology for arriving at ANNUAL USER DAYS. 1,656 TOTAL USER DAY from Table E-2 is multiplied by the number of weekend days and holidays that occur during the Peak Use Period (35 days). The result is divided by the proportion of the Peak Use Period expected on weekend days (0.6). The figure is then divided by the proportion of annual use (0.5) expected during the Peak Use Period. This figure is the ANNUAL USER DAYS for the General Recreation Total With Project Benefits.

Table E-4 estimates recreation resources visitation and activity values with the General Recreation Total With Project Benefits of 193,200 (ANNUAL USER DAYS) minus the Less Recreation Value (Without Project) of 178,383 (ANNUAL USER DAYS), which equals the Virginia Key recreation area facility demand of an additional 14,817 occasions/ demand annually. The annual user day figures can be translated into recreation resource visitation on an annual basis. These figures do not include tourist use or any other visitor use occasions/demands from outside Miami-Dade County. The estimate represents a conservative number that could prove to be greater or less in the future.

## **Incremental Analysis**

Incremental cost analysis is the comparison of additional project segment costs based on a standard unit of measurement that accurately reflects conditions and changes at those levels. It is a methodology for determining good financial investments given the dollar costs and non-dollar outputs. For every unit of change (output) a unit of cost is derived based on a progressive step-by-step manner. In this manner cost effective alternative plans are compared to alternative plans that will determine the 'biggest bang for the buck'. When additional costs (incremental cost) for additional amounts of output are compared the results of the comparisons determine the 'best buy' alternative. It is then

asked 'Is it worth it?' When that question can be answered the optimal alternative that is the most cost effective plan will have been determined.

Due to the nature of this project, the recreation plan is the same for all the alternatives. Hence the MCACES cost estimate for the recreational component of all alternatives is the same; \$126,500. Therefore, no incremental analysis is warranted. The average annual cost of the recreation component is \$26,100. The average annual recreation benefits of \$366,000 greatly exceed the cost of the recreation component.

<b>Type of cost</b>	<b>Cost in 2005 Dollars</b>
Initial Construction	\$126,500
Interest During Construction	<u>\$2,000</u>
Total Investment Cost	\$128,500
Annual Costs	
Interest and Amortization	\$7,400
OMRR&R*	<u>\$18,700</u>
Total Average Annual Cost	\$26,100

\* OMRR&R (operation, maintenance, repair, replacement, and rehabilitation)

Recreation resource deficits are noted in the 2000 Draft Statewide Comprehensive Outdoor Recreation Plan (SCORP) for the project area Region XI and include; hiking, swimming, bicycle riding facilities and saltwater fishing opportunities. The SCORP also notes that deficits in these resources are projected to increase over time. The objective of the proposed ancillary recreation component of the Virginia Key restoration project is to provide suitable recreation resources that will blend with the restoration project and take advantage of the interpretive opportunity. The proposed addition of a recreation component has not influenced the environmental restoration project goals, objectives or plan but will take advantage of the restoration element to provide interpretive and multi-use recreation resources.

A nature trail is proposed for the Virginia Key restoration project and would provide access to the restored ecosystems for environmental education via interpretive signage, birdwatching, plant and wildlife observation. Salt-water beach access is also proposed. Hiking trails and saltwater beach activities are SCORP deficits for Region XI that includes the project area. The 1995 National Survey of Recreation and the Environment (by the Outdoor Recreation Coalition of America) identified walking as the most popular outdoor activity in America

with approximately 66.7 percent of the population participating. Walking has increased approximately 42% from 1984 to 1995 (USACE, 1999).



## REFERENCES

Flood Control Act of 1944, Section 4 (Public Law 78-534).

Federal Water Project Recreation Act of 1965 (Public Law 89-72).

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**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

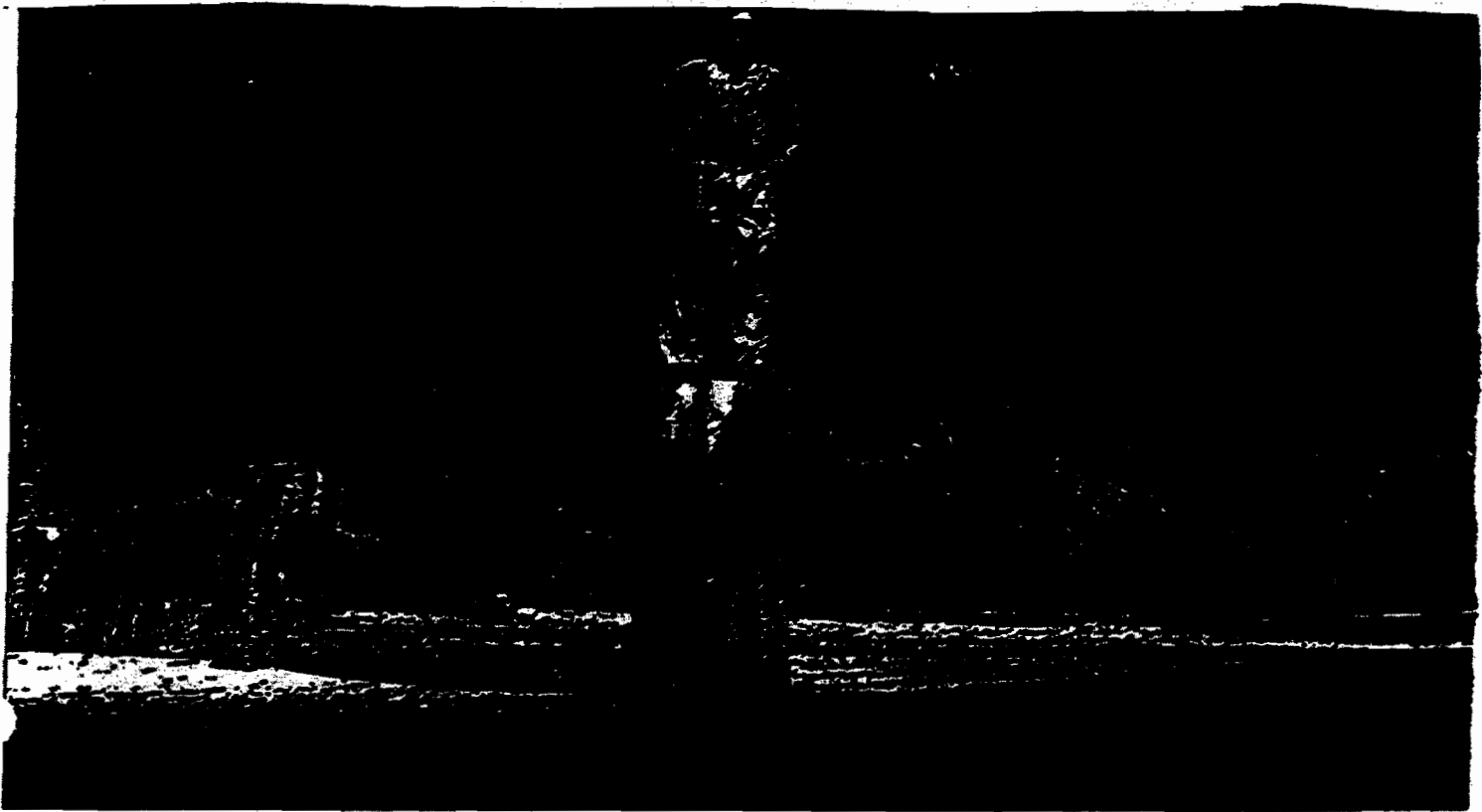
**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX F**  
**Newspaper Articles**

**U.S. Army Engineer District**  
**Jacksonville, Florida**

# Sun-Sentinel

SOUTH FLORIDA • WEDNESDAY • FEBRUARY 3, 1999



Staff photo/MIKE S

Jonathan Ullman, of the Sierra Club, looks out from the beach at Key Biscayne, one of the areas the city plans to develop.

## TAKING A STAND

### Miami officials, activists at odds over waterfront.

By JAY WEAVER  
Miami Bureau

MIAMI — As she talks excitedly to schoolchildren about sea-grape trees and other native plants on Virginia Key, Mabel Miller blends right in with her favorite habitat.

The retired teacher thinks she knows exactly what belongs on the key: an environmental education center at Virginia Beach.

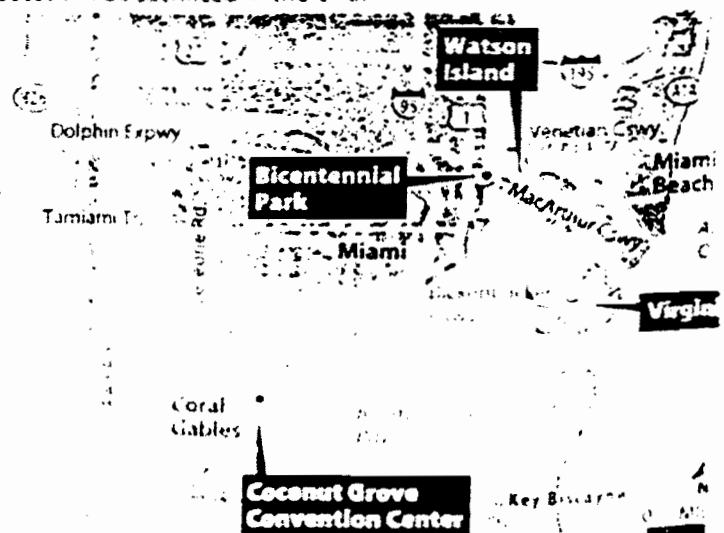
But Miami officials, still trotting over a fading fiscal crisis, have a grander plan for the city's only public beach: an ecology tourism complex, not with state grant for as much as \$125 a night.

"What's happened is, the city is so strapped that commissioners want it taken out of the hands of the public," said Miller of Key Biscayne. "It will be a country club resort."

The city's plan for Virginia Beach, closed for years because of lack of money for maintenance, is just the only thing making Miller and other environmentalists rabid.

### Prime properties

Miami hopes to pave the way for new commercial development of prime Biscayne Bay properties. Environmentalists worry public park access will be sacrificed in the end.



FROM PAGE 1A

## Miami officials, activists disagree on waterfront

Miami leaders, long embarrassed by their failure to create a signature waterfront, want to transform Virginia Key and other prime properties on Biscayne Bay into hotel, office and shopping developments.

"There hasn't been the vision to move these properties forward the way they should be," Mayor Joe Carollo said. "Since these are the best properties in Miami, we want to make sure we're going to get world-class developments."

Carollo's dream is to bring a new Florida Marlins stadium to Bicentennial Park, just north of the Miami Heat's waterfront arena under construction on the FEC railroad site near downtown.

He said the time is right to capitalize on these valuable public lands — including the long-neglected, 34-acre Bicentennial Park and 700-acre Virginia Key — because Miami is recovering from its financial scandal, the economy is still upbeat, and developers are taking the city seriously again.

As the city aggressively seeks proposals, Carollo is not about to let environmentalists like Miller get in the way of developments meant to attract tourists and locals.

"There are some people you're never going to please," Carollo said. "They want the whole city of Miami to be mangroves."

Here's what city officials want to see built:

■ **Coconut Grove Convention Center** — A mix of office towers, marine centers, conference halls and a large-scale hotel is on tap for 16.5 acres overlooking a 600-slip marina. The city is seeking development proposals that would complement the existing 150,000-square-foot convention center and include a marketplace attraction like CocoWalk.

■ **Watson Island** — Parrot Jungle, Japanese gardens and a regional visitors' center already are in store for the 88-acre island across from the Port of Miami. The city is seeking proposals for a resort hotel, marine facilities, and retail and office complexes. The island, bisected by the Mac-

Arthur Causeway, consists of boating clubs, fish shops, and a modest helicopter and seaplane service. Any final plan would require a referendum.

■ **Virginia Key** — Under consideration for Virginia Beach is an eco-tourism campground, which voters almost approved in a 1995 referendum. The site adjoins another sandy strip where native plants are undergoing restoration, thanks to a \$1 million federal grant. In addition, a Key West-style village with a hotel, shops, restaurants and a private marina is planned for the decrepit Marine Stadium. For the developments to move forward, Miami-Dade County would have to lift deed restrictions on the sites.

■ **Bicentennial Park** — The city is thinking about adding a major hotel, restaurants, shops and cultural attractions such as a museum at the park, a valuable bayfront asset that homeless people have used for years. In the mid-1990s, there was serious talk of turning the park and adjoining slip into a cruise-line terminal with a retail complex like the Bayside Marketplace at Bayfront Park. But that project ran aground when a corruption scandal beset the Port of Miami. Carollo now plans to talk with the new Marlins' owner, John Henry, about building a baseball stadium on the site.

Miami environmentalists cringe when they hear about the city's ambitious plans because, they say, open space and parks don't seem to be a priority. They have grown increasingly distrustful of city leaders, especially after the City Commission voted in December to approve a \$56-million development of four-story townhouses on a bayfront hammock in Coconut Grove. It's next door to the Barnacle State Historic Site, which includes a home built by Miami pioneer Ralph Munroe.

In January, the Sierra Club, Urban Environment League and other groups formed the Public Parks Coalition of Miami-Dade to bring pressure on the city to preserve its public lands on Biscayne Bay.

In a recent letter to Carollo, the group urged the city to redevelop Virginia Key and Bicentennial Park as urban parks akin to New York's Central Park, the Boston Public Garden and Baltimore's renovated inner harbor, with education centers, museums

## ...ayor Joe Carollo said the time is right to capitalize on public lands.

and limited commercial development.

"Redevelopment should not be a euphemism for essentially eliminating the parks through the construction of hotels, businesses and parking lots," the Jan. 27 letter said.

Jorge Espinel of Miami, an architect and a founding member of the Urban Environment League, said city officials are doing things backwards. They should conduct an international design competition and develop a master plan for Bicentennial Park and other waterfront lands, he said.

"Miami could be one of the fantastic cities in the United States, if not the world. But in terms of architecture and urban centers, it's a disaster," Espinel said. "It's not an international-level city in terms of thinking about urban and architectural issues."

Dena Bianchino, assistant city manager in charge of Miami's development plans, differs with Espinel's dim view. She argued that she and her staff are not a "bunch of money-grubbing bureaucrats" trying to maximize development on the waterfront to generate revenue from taxes and land leases.

Bianchino said the city's goal is to create urban park settings alongside commercial developments that appeal to South Florida residents and visitors alike.

"I think the view of Miami has changed dramatically," Bianchino said. "We are going to be marketing internationally, and we're going to be more open in terms of uses. We realize we're not the private sector. There are a lot of creative people out there."

Environmentalists remain skeptical. As he walks between the rotted pilings at Virginia Beach, Jonathan Ullman of the Sierra Club expresses his fears of what the city might do to the public beach.

"This property was not deeded over to the city of Miami for a private venture," said Ullman, of Key Biscayne. "The [City] Commission doesn't understand the value of preserving public lands like this. They always think for the moment, not of the big picture."



# The MIA

South's Largest Black Weekly ABC Circulation

TEMPORA MUTANTUR ET I

THE MIAMI TIMES

The Miami Times

Miami, Florida, Th

Thursday, March 4, 1999

## Virginia Key in jeopardy

By DINIZULU GENE TINNIE  
Special to The Times

On Wednesday, March 10 at 6 p.m. at Miami City Hall, located on Bayshore Drive at S.W. 27 Avenue, an issue of particular significance to the Black community will come before the Waterfront Board and activists are calling for a large public turnout.

At stake is the future of Virginia Key's public beach, once the only one available to Blacks, an issue that raises questions about the city's decision-making process itself, about public rights and about the preservation of the park's place in the history of the city's Black people.

The Waterfront Board will consider a well-financed application from a private developer to build an exclusive (\$250 per night) "eco-campground" on the Virginia Key. It would be geared to exploit the current fad of "ecological" tourism, which makes precious enclaves of preserved natural environment available to the well-heeled few who can afford to visit them.

As for all such big-ticket devel-

The City of Miami Waterfront Board will on Wednesday at 6 p.m. consider a plan by a private developer to create a pricey private campground on Virginia Key which clashes with proposals by activists for a Civil Rights Museum and Welcome Center on this historic site. Residents are being urged to attend the meeting and voice their concern.

opments, this one dangles the very tempting fruit of a lucrative future tax base before the commissioners of cash-strapped Miami.

And it is precisely the kind of issue which fueled the conflict between city and county government over whether to preserve intact the "Miami Circle," the recently uncovered remains of an ancient Tequesta construc-

tion at the mouth of the Miami River or to go forward with the building of a twin high rise and parking garage on that location.

The proposed private campground has already cleared one hurdle on its way to becoming a reality, as the City's Ad Hoc Advisory Committee on Virginia Key (another little-known body) approved it by a 3-1 vote. The committee advises the Waterfront Board, which, in turn, advises the City Commissioners, who will make the final decision on the use of the land.

As opponents of the campground plan are quick to point out, this committee is in fact only "advisory" (its decisions are not actually binding) and has no Black or Latino representation and the vote for approval only represents three of its six members. (It was passed by a quorum of four.)

This kind of "back room" decision-making, in meetings that are technically open to the public but, in reality, are generally unknown to ordinary citizens and often scheduled during

Please turn to VIRGINIA/ 2A

## VIRGINIA

Continued from 1A

working hours, also raises concern with the (non-)workings of the democratic process in the City of Miami.

An even more central concern of those who oppose the campground scheme is the city's handing over public land for private profit and the resulting exclusion of a large portion of the public.

When Miami-Dade County deeded 85 acres of Virginia Key land to the city in 1962, it was with the stipulation that the property be used for public park purposes. If the city fails to use it as such, the property reverts to the county. In the game of politics, however, such neat legal niceties are not always followed.

The definition of "public park" has been bent to include "camping," which actually makes it possible for Virginia Key to become Miami-Dade County's only ocean-front campground. But, as such, it would have, to preserve the unique and fragile natural environment there. So, the "eco-campground" wording was conceived to fit these requirements.

Opponents maintain that this private development will be too exclusive, will not sufficiently protect the environment and will effectively open the way for profit-making development schemes on all city-owned public lands.

Another concern is with the history of Virginia Key and its link to the civil rights struggle in Miami. It was, during segregation, the only beach in the county where Blacks - including visiting celebrities - could legally swim.

In 1945, in answer to a daring protest at Whites-only Haulover Beach by some Blacks who demanded equal right of access to Miami's beaches, a "Colored" beach was designated at on Virginia Key, which, in the beginning, could be reached only by boat from the Miami River, the strong current challenged swimmers and the relaxed atmosphere was tainted by the insult of segregation.

Still, the park became a favored venue for family outings, church socials, and other gatherings and opened new job opportunities.

Although it was a hard-won prize, with the emergence of the civil rights movement the beach would become the very symbol of Jim Crow in Miami, as demands escalated for the full integration of all public beaches and other facilities.

Because of this symbolic and historic value, a new proposal has arisen, supported by the Black Archives History and Research Foundation of South Florida, the Public Parks Coalition of the Urban Environment League and other groups to create a Civil Rights Park and Welcome Center at

Virginia Key Beach.

It would tell of the island's full history and memorialize for generations the story of the civil rights struggle both nationally and locally.

In this respect, Miami would join such cities as Birmingham, Memphis, and Savannah which have honored that struggle with civil rights museums that serve both tourists and residents alike.

As a park, similar in concept to the Franklin Roosevelt Memorial in Washington, D.C., which incorporates such features as restful areas for meditation, it would have a minimal disruptive impact on the environment of Virginia Key, while still allowing for true public camping accommodations.

(The private campground proposal may, at best, include only a small civil rights monument or other restricted form of commemoration).

Existing historic buildings and structures, such as the carousel building, concession stand and picnic pavilions, could also be included in the overall plan, thereby greatly reducing construction costs.

For further information, call the Black Archives at 305-636-2390 or the Public Parks Coalition of the Urban Environment League at 305-579-9133.



**Editorial****Preserve Virginia Key**

**O**n Wednesday, at 6 p.m., The City of Miami Waterfront Board is scheduled to discuss a proposal to permit the construction of a private "eco-campground" on historic Virginia Key. The proposal already has the endorsement of an advisory panel to the board and, if it is approved, it will go before the city commission for a final decision. It must not be approved.

The City of Miami is in a fast-track divestment mode supposedly the result of its persistent budget problems that led to the imposition of a state oversight board on its handling of the people's money. That is at the center of the dispute between the city and Miami-Dade County over preserving the so-called Miami Circle. It is at the heart of the move to hand Virginia Key to a private developer. Indeed, there is a strong suspicion that the proposed "eco-campground" is just a ploy to circumvent a restriction imposed by the county when it gave the land to the city that it must be used only for park-related purposes. The board and the commission must not be party to such a deception.

However, the fact that corrupt and inept bureaucrats and politicians bungled the city's finances should not mean that places that are signposts of Miami's history should be disposed of without regard to their significance. If it has come to that, then there is no need to preserve the city as an entity unto itself. Virginia Key has very great significance to the Black community, as the first beach set aside for Blacks during the days of segregation. To preserve it as a landmark, some activists have been planning to push for the creation of a monument on the key to help underpin Miami's Black history. Such landmarks are very scarce in a city whose creation would have been impossible without Black support more than a century ago.

The Waterfront Board should bear this suggestion in mind and reject the plan to turn the land over to private development. Meanwhile, those who advocate a historical monument on the site should be given all the encouragement and support needed to make their plan a reality. After all, Black History Month has only just ended — and what is the purpose of celebrating it if the celebration is nothing more than lip service?

# National Report

The New York Times

## Developers Covet a Florida Island Beach That Was Born of Racism

By RICK BRAGG

VIRGINIA KEY, Fla., March 25 — For years in Dade County, until 1945, the Atlantic Ocean was emerald green and deep blue, the beach was black-speckled gray, and the people who swam and sunbathed and built castles in the sand were, by law, white. Jim Crow laws banned black people from Miami Beach, from Key Biscayne, from a picture-postcard ocean that gave South Florida a reason for being.

Think, say black residents old enough to remember, what it was like to live beside such cool beauty and not be able to stick a toe in it.

For the people who did much of the heavy lifting in this utopia, it was a tropical paradise with a padlock. As early as the 1920's, the men who created Miami, dredging it from silt and rotted mangroves, talked about a beach just for blacks, to avoid inevitable protests. But it was in 1945 before county commissioners made a deserted barrier island Virginia Key the beach for black people.

But at the time there was no bridge to get to the island, about 5 miles off Miami and immediately north of Key Biscayne, still makes any older black people here shake their heads. "Don't quite remember it we got there," said Athaliah, 83, the first black City Commissioner in Miami.

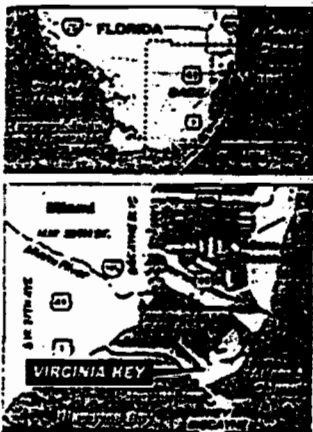
But a beach born from racism and used as a vehicle for segregation is on to become an important regional and cultural center for blacks in this county, now called Miami-Dade, drawing church groups, fighters and famous entertainers. They rode a ferry at first, until a bridge was built, and made Virginia Key a playground of their own that did only when the county started closing other beaches in the desegregation days of the mid-1960's.

Now, as developers eye this small island of largely palm and sand with visions of turning it into an upscale resort area, the older black residents of Miami-Dade are shaking their heads once again. Developers have coveted the key for years, and now the City of Miami, its legal owner, is considering the property to entrepreneurs who have suggested building a resort hotel with a casino, restaurants, and entertainment venues to an upscale campsite with cottages, picnic areas and recreational vehicles.

But for environmentalists, and black activists are in a quandary. They want the key, but the city says it is about 1,000 acres to remain undeveloped, except for a civil rights park that would



This beach on Virginia Key was once for blacks, and they want a memorial on the key, while Miami is considering leasing the area to developers.



The New York Times

honor black residents who fought against segregation. If it belongs to anybody, older black residents said, Virginia Key belongs to them, because the county once gave it to them to keep them off the white beaches.

"It served its purpose," said John D. Johnson, 85, a retired Municipal Court judge and one of the many older black residents who remember why the island once belonged to them.

"It has a history behind it," said Mr. Johnson, who remembers driving out from Overtown, one of Miami's black neighborhoods, for barbecues on the Fourth of July.

"Pleasant memories we have," he

said, of a difficult time.

Emphasizing the county's position, Dema Stanchino, assistant city manager for development for Miami, said, "The point is that we have this beautiful tropical urban island where we can offer people a sophisticated hotel experience, a camping experience and a wildlife destination."

Mingling with the signatures of white pioneers on the city's first charter of more than 100 years ago are those of the black residents who helped build the city, including Bahamians who became a part of the city's history. But in this place they helped build, many blacks consider themselves forgotten.

As the political and economic power gradually shifted from white residents to Hispanic ones, particularly the Cuban-Americans who have made Miami home, the shootings of blacks by white and Hispanic police officers led to riots in the Overtown and Liberty City sections in 1969 and 1981. It is those riots, many black residents say, that overshadow a much richer, and more substantial, history in which black residents fought against Jim Crow.

"In Miami, I can't think of anything very significant where those persons are remembered," said Mrs. Range, the former Commissioner. But a park, dedicated to them on the same island that whites once used to exile blacks, "is something that we are really due."

It is only human nature, she said, that black residents would push for the monument at a time when developers want to turn it into a play-

ground for people who can afford waterfront cottages.

City and county leaders gave them the key, black residents said, to quiet a growing resentment that had already led to protests and threatened to bring bad publicity to a tourist area that could not afford it.

It was the mid-1940's, long before the battle against segregation began to capture national headlines. Black residents here, led by the Colored Ministerial Alliance and other groups, went swimming at Haulover Beach in the hope of being arrested and getting a chance to test the Jim Crow laws in court. City and county leaders gave them their own beach instead.

Black residents had to pay 75 cents — a steep price in 1945 — for a ferry ride from a dock on the Miami River. But even though black residents knew the key had been given to them begrudgingly, it quickly became a place for celebrations, where members of fraternities, sororities, church groups and families swam, ate and played, said Mrs. Range and others who came here.

Over time, the county built cottages, cabanas and barbecue pits, and finally, in 1947, a bridge. Entrepreneurs like Nat King Cole, who were banned from white hotels on Miami Beach, stayed here, with black baseball players, boxers and others. The servants who waited on wealthy, white winter visitors were also banned from the white beaches, so they stayed on the key, too.

"We had fun," said Walter Anders, 70, who remembers the key's hey-

day. But the beach was also "a white factor," Mr. Anders said. "It was a place where you made friends."

The civil rights movement eventually gave blacks access to beaches and made Virginia Key necessary. A hurricane in the 1980's destroyed much of what remained of the permanent building and now the Public Parks Council, a Miami group, and the others to leave the key to the state wading birds and other wildlife, Greg Bush, a spokesman for the alliance. Developers would have the barrier island that has miraculously survived South Florida's away development, Mr. Bush said, while a park and monument would not intrude on that wildlife near much as motor homes.

"We're worried," he said, that the city will sell both the history and ecology of the place, for a profit.

Ms. Stanchino, the assistant manager, said the city would leave the beach open to the public, add "We're not going to touch the crucial wildlife area of it. I don't think real issue is the historical nature of the property. It's development vs. nondevelopment."

Mrs. Range, the former commissioner, does not think it odd blacks want to build a monument to their struggle on the very site of their onetime exile.

"We forget about these things," she said of the black history on the key, "and when it comes to a point when someone wants to do something else, you remember."

**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX G**

**Correspondence**

**U.S. Army Engineer District**  
**Jacksonville, Florida**

MEEK  
DISTRICT, FLORIDA  
COMMITTEE ON  
APPROPRIATIONS  
SUBCOMMITTEES  
TREASURY, POSTAL  
SERVICE, AND GENERAL  
GOVERNMENT  
VA, HUD, AND  
INDEPENDENT AGENCIES



**Congress of the United States**  
**House of Representatives**  
Washington, DC 20515-0917

Please Respond To:

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(305) 576-9753 FAX

April 14, 2000

COL Joe R. Miller  
District Engineer, CESAJ-DE  
US Army Corps of Engineers  
400 West Bay Street  
P.O. Box 4970  
Jacksonville, FL 32232

Dear Colonel Miller:

I write to request that the US Army Corps of Engineers conduct a study for the restoration of Virginia Key, a barrier island in Miami, Florida, which is part of a coastal chain that includes Biscayne National Park and extends to the Florida Keys. The study, to be included as an Interim Report in the Biscayne Bay Study, would examine ways to repair coastal structures, nourish the beach, and restore and enhance native environmental features and wetlands.

As a barrier island, Virginia Key has a fragile ecology which is in desperate need of restoration. The extensive intrusion of harmful exotics species, the damage caused by Hurricane Andrew, the erosion of the protective beach, and the usage of one of its natural ponds as a waste dump are just some of the elements that have contributed to its deterioration.

In addition, Virginia Key Beach is the site of the former "Colored Beach" in Miami—one of the few places where African Americans could go to swim in Miami in the 1940s, 1950s and early 1960s. This project is extremely important to the African American community in Miami because, for decades, it was the only place that we could legally swim and enjoy beautiful Biscayne Bay. Currently, the beach is in desperate need of nourishment.

As you know, Virginia Key's restoration has broad support throughout Miami-Dade County. This project is one of my highest priorities and it is extremely important to me that this study be completed by next Spring to coincide with the FY2002 Appropriations cycle. I would appreciate all that you can do to expedite the study.

Sincerely,

CARRIE P. MEEK  
Member of Congress

CPM/lm

APR 21 2000



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**JACKSONVILLE DISTRICT CORPS OF ENGINEERS**  
**P. O. BOX 4970**  
**JACKSONVILLE, FLORIDA 32232-0019**

**MAY 02 2000**

**Coastal/Navigation Section**  
**Plan Formulation Branch**  
**Planning Division**

**Honorable Carrie P. Meek**  
**US House of Representatives**  
**401 Cannon House Office Building**  
**Washington, D.C. 20515-0917**

**Dear Ms. Meek:**

This is in reply to your April 14, 2000 letter regarding restoration of Virginia Key, a barrier island in Miami, Florida. You have asked that the U.S. Army Corps of Engineers initiate a study to examine the Federal interest in restoration and enhancement of the native environment, including beaches and coastal structures.

Mr. Richard Bonner of my staff has discussed the matter with Mr. Carlos Espinosa, Miami Dade County, and we concur that the Biscayne Bay feasibility study authorized by Congress in 1982 provides sufficient authority to begin studies which will address the island's water resources problems. The requested study must be accomplished in two phases, a reconnaissance phase and a feasibility phase. Reconnaissance phase studies are required to define the water resource problem(s) warranting Federal participation, identify the Federal interest, and assess the level of non-Federal support. If a Federal interest is identified, then feasibility phase studies will be recommended to evaluate alternative methods of addressing the problem(s) and identify a preferred plan for construction authorization.

Reconnaissance studies are now in progress and will be summarized in a Section 905(b) Analysis Report to be submitted by 31 July 2000 to our higher authorities for Washington level review and approval. Costs for reconnaissance phase efforts are a 100% federal expense which will be paid from available Biscayne Bay feasibility study funds. A letter of support from the potential non-Federal sponsor will be needed so it can be included with this report when it is submitted to our higher authorities.

If a positive Section 905(b) Report is produced and approved, a Feasibility Cost Sharing Agreement (FCSA) with attached Project Study Plan (PSP) will then be quickly developed in cooperation with the non-Federal sponsor. These documents will describe the scope of work, schedule and the 50/50 cost sharing required for the feasibility phase studies. Initiation of feasibility studies will occur as soon as the Corps and the non-Federal sponsor have executed the FCSA and local contributions have been received.

We are in the process of setting a date for a site inspection with the local sponsor in early May 2000. We will inform your staff of the site visit date once the arrangements with the project sponsor have been finalized.

If additional information is needed, please feel free to call me, or contact Mr. Joseph R. Burns, Congressional Liaison at (904) 232-2243.

Sincerely,

*for C.P. Boruch LTC, EP Det Cde*

Joe R. Miller  
Colonel, U.S. Army  
District Engineer

Christopher P. Boruch  
Lieutenant Colonel, U.S. Army  
Deputy District Engineer

**Copies Furnished:**

Commander, U.S. Army Corps of Engineers (CECW-L)  
Commander, South Atlantic Division (CESAD-PM)  
Mr. Carlos Espinosa, Miami-Dade County

CARRIE P. MEEK  
17TH DISTRICT, FLORIDA

COMMITTEE ON  
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GOVERNMENT

VA, HUD, AND  
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# Congress of the United States

House of Representatives

Washington, DC 20515-0917

May 5, 2000

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WRDA 2000  
# 099

The Honorable Sherwood L. Boehlert  
Committee on Transportation and Infrastructure  
Water Resources and Environment Subcommittee  
B-376 Rayburn HOB  
Washington, DC 20515

Dear Chairman Boehlert:

As you continue to work on the Water Resources Development Act of 2000, I ask for your support on the following three provisions.

First, the restoration of Virginia Key, a barrier island in Miami, Florida, which is part of Biscayne Bay, is my highest priority. The enclosed bill language would authorize a project to repair Virginia Key's coastal structures, nourish the beach, and restore and enhance native environmental features and wetlands, pursuant to the completion of a study by the US Army Corp of Engineers that is currently underway. Virginia Key has a fragile ecology which is in desperate need of restoration. The extensive intrusion of harmful exotics species, the damage caused by Hurricane Andrew, the erosion of the protective beach, and the usage of one of its natural ponds as a waste dump are just some of the elements that have contributed to its deterioration. a.

Furthermore, Virginia Key Beach is the site of the former "Colored Beach" in Miami—one of the few places where African Americans could go to swim in Miami in the 1940s, 1950s and early 1960s. This project is extremely important to the African American community in Miami because, for decades, it was the only place that we could legally swim and enjoy beautiful Biscayne Bay. Virginia Key's restoration has broad support throughout Miami-Dade County.

Second, I have worked extensively with Administration officials to ensure that minority and limited income populations fully participate in the restoration of the Everglades and that minority contractors have a fair chance of competing successfully for contracts during the implementation phase. I worked with the Administration as it drafted its bill; the result is two provisions regarding minority and disadvantaged individuals. b.

The first provision establishes a goal that no less than 10% of the amounts made available in federal contracts be expended by small businesses owned and controlled by socially and economically disadvantaged individuals. The second provision allows the Secretary of the Army to establish an outreach and monitoring program regarding minority and limited income individuals participation in the



provisions from the draft bill for your information.

The Virginia Key restoration project, the 10% goal in federal contracting, and the minority outreach program during the Everglades restoration, are my highest priorities to be included in WRDA 2000. I appreciate your support and efforts to have this language included in the final bill.

Again, thank you for the opportunity to bring them to your attention and I look forward to working with you on this important legislation.

Sincerely,



CARRIE P. MEEK  
Member of Congress

CPM/lm  
Enclosures

*DeWitt*



*Table*  
Please Respond to:  
101 CANNON HOUSE  
OFFICE BUILDING  
WASHINGTON, DC 20515  
(202) 225-4506  
(202) 228-0777 FAX  
3550 BISCAYNE BLVD  
SUITE 500  
MIAMI, FL 33137  
(305) 576-8303  
(305) 576-9753 FAX

**Congress of the United States**  
**House of Representatives**  
Washington, DC 20515-0917

July 25, 2000

Lt. Gen. Joe Ballard,  
Chief of Engineers, US Army Corps of Engineers  
20 Massachusetts Ave., NW  
Washington, DC 20314

*Action: CW*  
*(CS signature)*

*CF: CS-C*

Dear Lt. Gen. Ballard:

I write to thank you for your strong support of my effort to restore Virginia Key, FL and for providing the needed funds to complete this project through your Capital Grants Program. I genuinely appreciate your help.

This project is personally important to me. Virginia Key Beach is the site of the former "Colored Beach" in Miami—one of the few places where African Americans could go to swim in Miami in the 1940s, 1950s and early 1960s. This project is extremely important to the African American community in Miami because, for decades, it was the only place that we could legally swim and enjoy beautiful Biscayne Bay. I took my own children there to swim.

Virginia Key's restoration has broad support throughout Miami-Dade County. Virginia Key's fragile ecology is in desperate need of restoration. The extensive intrusion of harmful exotics species, the damage caused by Hurricane Andrew, the erosion of the protective beach, and the usage of one of its natural ponds as a waste dump are just some of the elements that have contributed to its deterioration.

I wanted you to know that after our conversation, I spoke to Miami-Dade County Mayor Alex Penelas about the necessary local 35% funding match. He told me that Miami-Dade County would have up to \$1.725 million available by next Spring, when hopefully construction can begin on this project.

I look forward to hearing from your staff regarding the details on how we will assure full funding for this project.

In addition, I am enclosing our proposed language for the Water Resources Development Act of 2000. If this is consistent with the two-pronged approach that you mentioned, I would appreciate you communicating your support for this language to the authorizing committees in the House and Senate.

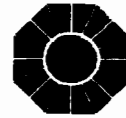
Again, thank you for your assistance. Is there anyway I can convince you to stay a your post for another year?

Sincerely,

A handwritten signature in cursive script that reads "Carrie".

CARRIE P. MEEK  
Member of Congress

CPM/lm  
Enclosures



**STEPHEN P. CLARK CENTER**

**OFFICE OF COUNTY MANAGER  
SUITE 2910  
111 N.W. 1st STREET  
MIAMI, FLORIDA 33128-1994  
(305) 375-5311**

July 28, 2000

Colonel Joseph R. Miller  
U.S. Army Corps of Engineers  
Jacksonville District  
400 West Bay Street  
Jacksonville, Florida 32232

RE: Virginia Key Restoration

Dear Colonel Miller:

As you are aware, members of my staff and representatives of the City of Miami have been working closely with the District in evaluating the potential for Corps participation in various elements of the above referenced project. Several objectives of the restoration plan, such as environmental restoration and beach erosion control, may be consistent with existing Corps authorities, and we would request your assistance in implementing a full evaluation of these potential opportunities.

We were recently informed that a preliminary commitment for local sponsorship of the project would be desirable prior to the initiation of a full feasibility study. This letter is to preliminarily confirm the willingness of the County, through the Department of Environmental Resources Management (DERM), to serve as local project sponsor in an effort to expedite the approval and completion of a feasibility study of potential Corps projects on Virginia Key. Formalizing this commitment would be contingent upon the willingness of the City of Miami to participate in the funding as landowner and to have the County assume the local sponsor role, and upon an understanding of the total non-federal funding commitment the project would entail. We are confident that these and other issues can be easily addressed following the completion of a study to more specifically identify the scope of the project, and the potential for Corps participation.

Please contact Mr. John Renfrow, Director of DERM, if you have any questions or need any additional information regarding this issue. Thank you in advance for your assistance in moving ahead on this important project.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. R. Stierheim', followed by a long horizontal line extending to the right.

M. R. Stierheim  
County Manager

cc: Honorable Carrie Meek, Congresswoman, District 17  
Honorable Alex Penelas, Mayor, Miami-Dade County  
Honorable Chairperson and Members, Board of County Commissioners  
Richard Bonner, United States Army Corps of Engineers  
Albert Ruder, City of Miami

DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers  
WASHINGTON, D.C. 20314-1000

31 JUL 2000



REPLY TO  
ATTENTION OF:

Honorable Carrie P. Meek  
U.S. House of Representatives  
Washington, D. C. 20515

Dear Ms. Meek:

Reference your letter dated July 25, 2000, and our telephone conversation of July 28, 2000, regarding local interest in restoration of the historic beach area on Virginia Key, Florida, a coastal barrier island in Miami, Florida.

As you are aware, the United States Army Corps of Engineers, Jacksonville District, was already involved in a 905(b) preliminary assessment of shoreline and upland environmental conditions on Virginia Key. The draft report is scheduled to be submitted for review in the next few days and will recommend Federal participation in shoreline and upland environmental restoration efforts at this site.

I am pleased to report that preliminary information reviewed by my staff supports the Jacksonville District's draft recommendation, and we anticipate quick approval for initiation of detailed design and construction efforts. We are also pleased that Miami-Dade County has indicated their interest in being the local sponsor for this project.

The recommended plan of improvements includes shoreline improvements consisting of granite and timber groins and placement of approximately 80,000 cubic yards of beach sand to restore and protect Virginia Key where beach erosion has been accelerated due to previous Federal improvements to the Port of Miami. Shoreline improvements, as mitigation for negative impacts of previous harbor improvements, are authorized under our existing Continuing Authorities Program, Section 111.

Under Section 111 authority, preparation of the required feasibility report and other design studies are a 100 percent Federal cost for the first \$100,000, with the balance being cost shared 50 percent Federal and 50 percent local. For construction, the local sponsor will be responsible for all lands and easements while the Federal Government will be responsible for all construction costs. Preparation of the feasibility report and construction plans and specifications is forecast to take 12 months and cost approximately \$300,000. The preliminary construction cost estimate is about \$4 million. We anticipate awarding the construction contract in late Fiscal Year (FY) 2001, provided that funds are available and significant permit issues involving seagrasses and turtle nesting are resolved without restrictions on the timing of construction activities. Approximately \$300,000 in Federal funds is required in FY 2001 to prepare the feasibility report, prepare construction plans and specifications, and award the construction contract.

Also recommended are upland environmental restoration improvements on Virginia Key. About 50 to 100 acres of the island were previously used for dredged material disposal during earlier Federal improvements to the Port of Miami. As mitigation for previous negative impacts, the 905(b) report will recommend removal of invasive exotic plants and restoration of natural wetlands and native coastal plant communities on 150 to 200 acres of the Virginia Key Beach Park area owned by the city of Miami. These upland environmental improvements are authorized under our existing Continuing Authorities Program, Section 1135.

Under the terms of Section 1135, the local sponsor is required to cost share both design and construction. The total project cost will be shared 75 percent Federal and 25 percent non-Federal and includes preparation of an Environmental Restoration Report and construction plans and specifications, credit to the local sponsor for all required lands and easements, and project construction costs. Preparation of the required Environmental Restoration Report and construction plans and specifications is forecast to require 24 months, cost approximately \$600,000, and will be completed using 100 percent Federal funds. Local contributions are not required until the start of construction. We anticipate awarding the construction contract in late FY 2002. The preliminary construction cost estimate is about \$6 million, so Federal and non-Federal costs will be about \$4.5 million and \$1.5 million, respectively. Approximately \$300,000 in Federal funds is required in FY 2001 to initiate the Environmental Restoration Report.

Section 1135 also authorizes inclusion of recreation features up to 10 percent of project cost with costs shared 50 percent Federal and 50 percent non-Federal. This is important to local interests working to preserve historic recreation features at Virginia Key Beach Park.

This project provides a good example of the value of the Continuing Authorities Program as no new legislation is required to authorize the recommended Virginia Key improvements. However, implementation will depend on availability of funding. Historically, funding for this program has been very limited and competition for available funds has increased in recent years. In recognition of this, Congress has identified specific projects in various appropriations bills to ensure funds are made available for those projects.

The Corps looks forward to working with you on the Virginia Key project. If you need additional information on this project or another Corps effort, please feel free to contact me or my staff.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe N. Ballard", with a large, sweeping flourish at the end.

Joe N. Ballard  
Lieutenant General, U.S. Army  
Commanding

07 August 2000

MEMORANDUM FOR Commander, HQUSACE,      ATTN: CECW-B

SUBJECT: Section 905(b) (WRDA 86) Analysis, Virginia Key, Biscayne Bay, Dade County, Florida

1. Enclosed for approval is the Section 905(b) (WRDA 86) Analysis for Virginia Key, Biscayne Bay, Dade County, Florida. Federal interest has been identified in project proposals for harbor induced shoreline erosion mitigation and environmental mitigation. The Department of Environmental Management (DERM), the study non-Federal Sponsor, supports the project. DERM's letter of support is enclosed. The Virginia Key Park Civil Rights Task Force has also expressed strong project support.
2. We recommend that the feasibility study for the project be pursued under the Continuing Authorities Program. It is recommended that the proposal for harbor induced shoreline erosion mitigation be pursued under the authority of Section 111 of the 1968 River and Harbor Act, as amended. It is recommended that the proposal for environmental mitigation be pursued under authority of Section 1135 of the 1986 Water Resources Development Act, as amended. Request approval to pursue separable Section 111 and Section 1135 feasibility phase studies.
3. Mr. Mitch Granat, the Planning Division Technical Team Leader, can be reached at 904-232-1839. Mr. Glenn Landers, the Project Manager, can be reached at 904-232-2125 with management questions.

FOR THE COMMANDER:

ENCLS

JAMES C. DUCK  
Chief, Planning Division

Copy Furnished:

Commander, South Atlantic Division, ATTN: CESAD-ET-PL  
Commander, HQUSACE, ATTN: CECW-PE



CECW-PM (CESAJ-PD-PN / 7 Aug 00) 1<sup>st</sup> End Gary Hardesty/202-761-1723  
SUBJECT: Virginia Key, Biscayne Bay, Dade County, Florida

August 10, 2000

HQ, US Army Corps of Engineers, Washington, DC 20314-1000

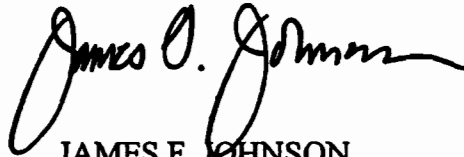
15 AUG 2000

FOR Commander, South Atlantic Division ATTN: CESAD-ET-PL

1. The Section 905(b) Analysis for the subject study and letter of intent are approved for proceeding with two feasibility studies under the Continuing Authorities Program. The district should plan to convene an in-progress-review meeting early in the feasibility phase to ensure that the studies are focused and tailored to meet the specific objectives. Based on results of the in-progress-review, the project study plan may need to be revised to better define the depth of analysis required and/or refine study constraints.

2. Submission of the model FCSA is not required, provided no deviations are requested.

FOR THE COMMANDER:



JAMES F. JOHNSON  
Chief, Planning and Policy Division  
Office of Deputy Commanding General  
for Civil Works

wd Encl

CARRIE P. MEEK  
17TH DISTRICT, FLORIDA

COMMITTEE ON  
APPROPRIATIONS

SUBCOMMITTEES  
/A, HUD, AND  
DEPENDENT AGENCIES

TREASURY, POSTAL  
SERVICE, AND GENERAL  
GOVERNMENT



**Congress of the United States**  
**House of Representatives**  
**Washington, DC 20515-0917**

Please Respond To:

2433 RAYBURN HOUSE  
OFFICE BUILDING  
WASHINGTON, DC 20515  
(202) 225-4506  
(202) 226-0777 FAX

3550 BISCAYNE BLVD.  
SUITE 500  
MIAMI, FL 33137  
(305) 576-8303  
(305) 576-9753 FAX

**MEMORANDUM**

To: All Concerned  
From: U.S. Rep. Carrie P. Meek  
Date: 12/4/01  
Subject: Status Report on Virginia Key Beach Legislation and Projects

As you know, since Ms. Athalie Range first brought to my attention the current state of disrepair of Virginia Key Beach, and its potential to once again be an educational, recreational and environmental asset to our community, I have been working hard to transform Virginia Key Beach and help it attain its full potential. The following activities highlight my efforts.

- In May of 2000, I met with Lt. General Joe Ballard, Commander and Chief of Engineers, U.S. Army Corps of Engineers (USACE), and shortly thereafter, with his successor, Lt. General Robert B. Flowers to arrange for the beach re-nourishment and restoration of the natural environment. I am pleased that this project is moving forward and I am deeply grateful to the USACE's Jacksonville Office, the City of Miami and Miami-Dade County for their hard work, strong support and cooperation in implementing this project.
- On June 7, 2001, I introduced H.R. 2109, which authorizes the Secretary of the Interior to conduct a special study of Virginia Key Beach to evaluate the national significance of the site and determine its suitability for inclusion in the National Park System. A copy of the bill is attached.
- On June 20, 2001, I met with Fran Minella, Director of the National Park service and former Director of the Division of Recreation and Parks for the Florida Department of Environmental Protection, to inform her of this important project and to seek her support for my legislation.
- At my request, Senator Bill Nelson introduced my bill on August 2, 2001 as S. 1312. Since that time I have been pressing for Congressional hearings on both of these bills
- I am pleased to inform you that the House Resources Committee's Subcommittee on National Parks, Recreation and Public Lands will hold a hearing on my bill, H.R. 2109, on December 13, 2001. I am delighted that Ms. Range has agreed to join me in testifying at this hearing on our Virginia Key Beach project.
- In addition, I have met with Congressional Leaders regarding the Urban Park and Recreation Recovery Program (UPARR), a competitive grant program in the Department of Interior, directing Federal funds to cities for rehabilitation of critically needed recreation facilities. The House Appropriations Committee, on which I serve, provided \$30 million for FY2002 for this program, and I am urging the City of Miami to submit an application for Virginia Key Beach.

This project is my highest priority and I urge everyone involved to do everything possible to move this project forward to completion as expeditiously as possible. Again, I want to thank you for your hard work and commitment to this project. I look forward to working with you in the coming months.



## **Office of the City Manager**

City of Miami Riverside Center  
444 S.W. 2<sup>nd</sup> Avenue, Suite 1023  
Miami, FL 33130  
(305) 416-1025  
(305) 416-1019 Telecopler

### **FAX COVER SHEET**

**DATE:** October 23, 2002

**TO:** Colonel James G. May  
District Engineer  
US Army Corps of Engineers

**PHONE:**  
**FAX:** 904-899-5001

**FROM:** Rita Lagace  
Executive Secretary

**PHONE:** (305) 416-1060  
**FAX:** (305) 416-1019

**Number of pages including this page:** 3

**Re:** Section 1135 Ecosystem Restoration Project, Virginia Key, Miami-Dade County, Florida

**MESSAGE:** Attached is the letter signed by the Carlos A. Gimenez, the City Manager, in reference to the above-captioned Project.

**c:** Lynette Austin, Executive Director  
Virginia Key Park Trust Fax 305-571-8311

Erica Wright, Assistant City Attorney Fax 305-416-1801

Ronda Vangates, Special Assistant to the City Manager

*Notice.* This transmission is for the confidential use of the above recipient only. If this transmission is received by mistake, please call 416-1025 for further instructions.

# City of Miami

CARLOS A. GIMENEZ  
CITY MANAGER



P.O. BOX 330708  
MIAMI, FLORIDA 33233-0708  
(305) 416-1025  
FAX (305) 400-5043

OCT 23 2002

Colonel James G. May, District Engineer  
U.S. Army Corps of Engineers  
South Atlantic Division  
P.O. Box 4970  
Jacksonville, Florida 32232

Subject: Section 1135 Ecosystem Restoration Project, Virginia Key, Miami-Dade County, Florida

Dear Colonel May:

The City of Miami (City) is interested in working with the U.S. Army Corps of Engineers (USACE) in the development and implementation of a Section 1135 ecosystem restoration project for portions of Virginia Key in Biscayne Bay, Miami-Dade County, Florida ("Project").

This letter formally acknowledges the City's willingness to become the non-federal sponsor for Project.

It is understood that once the federal interest in the Project is confirmed, the City would be expected, as the non-federal sponsor, to contribute twenty-five percent (25%) of the costs of implementation of the habitat restoration components of the Project, including planning and design phases (feasibility study and plans and specifications), project construction and monitoring. The present estimated costs for this aspect of the Project are \$3,325,100. The City understands that presently it would be expected to contribute \$831,275 toward this aspect of the Project.

The City also understands that it would share evenly (50 percent to 50 percent) with the federal government the costs of the ancillary recreational and educational components anticipated at the restoration site. If the costs of the recreational and educational components of the Project exceed ten percent (10%) of the costs for the total Project, then the City will be expected to pay one hundred percent (100%) of the additional costs. The present estimated costs for this aspect of the Project are \$91,600. As a result, City would

be expected to contribute \$45,800 toward this aspect of the Project. The specific ancillary recreation component plans will be fully developed jointly during the cost-shared feasibility and plans-and-specifications phases. To sum, the total present estimated total cost for this Project is \$3,416,700. According to the cost apportionment outlined above, the City would be asked to contribute \$877,075 toward the total costs of the Project.

The City understands that the restored areas would require long-term operation, maintenance, repair, rehabilitation, and replacement costs, (O & M) after initial restoration activities are completed and will be responsible for monitoring and implementation costs after the Project has been completed. Our Parks and Recreation Department would be responsible for O & M at these sites at 100 percent City expense. It is our understanding that the estimated annual O & M costs will be approximately \$32,000. The restored areas and recreation components would become important parts of the Virginia Key Beach Park restoration and the historic memorial Project plans.

We are excited about the opportunity to develop a first-rate community historic and environmental park, dedicated to the Civil Rights struggle and to the contributions of African-Americans to the South Florida area. The Project would provide the foundation for a unique federal and local government partnership that would serve as a model for other communities to follow.

Neither this letter of intent nor any reports or documents prepared by the USACE commits either agency to any level of funding for this Project. While not considered a binding contract, it is furnished to document our support for the Project and our intent to act as a local sponsor for its implementation in accordance with the requirements of local cooperation by the Army Corps of Engineers. The City of Miami is hopeful that the benefits associated with the Project will satisfy the goals of the Section 1135 program and will provide us with the opportunity to become a cost-sharing partner with the Jacksonville District, USACE in this endeavor.

We sincerely appreciate USACE assistance to date in the development of this Project and the persistent efforts provided by the Jacksonville District staff. We look forward to continued USACE support in this important project for African Americans and all citizens of the City of Miami and in the Miami-Dade County community. We are sure it would be of lasting benefit to all.

Sincerely,



Carlos A. Ginzalez  
City Manager

**SECTION 1135**  
**ECOSYSTEM RESTORATION REPORT**  
**AND**  
**ENVIRONMENTAL ASSESSMENT**

**VIRGINIA KEY**  
**MIAMI-DADE COUNTY, FLORIDA**

**APPENDIX H**

**List of Meetings**

**U.S. Army Engineer District**  
**Jacksonville, Florida**

## Meetings – Virginia Key

<u>Date</u>	<u>Type of Meeting</u>	<u>Agencies Involved</u>
9 May 2000	Site Visit	COE, Dade County, Civil Rights Task Force, Cong. Meek Office, Sierra Club of Virginia Key
12 June 2000	Civil Rights Task Force	City of Miami
21 Dec 2000	Virginia Key	COE, City of Miami, City of Miami Parks & Rec Dept., City of Miami-Atty, Virginia Civil Rights Task Force, VA Key Parks Advisory Board, DERM, FL DEP, Miami-Dade Inter- Governmental Office, USFWS, National Marine Fishery Serv., M-D Parks, , Tropical Audubon Society
17 January 2001	Section 1135 Meeting	COE, USFWS, National Marine Fishery Serv., M-D Parks, City of Miami Parks Dept, Tropical Audubon Society, Dade P&R, City of Miami Real Estate, City of Miami-Atty, Virginia Civil Rights Task Force
7 May 2201	Virginia Key Sect. 1135	COE, City of Miami Consultant, City of Miami, Miami Dade Parks, US Rep Carrie P. Meek Office, City of Miami/REED, City Parks & Rec Dept., Virginia Key Beach Task Force, DERM, City of Miami Parks
17 January 2002	Site Visit	COE, DERM, Task Force
13 March 2002	Site Visit	COE, USFWS